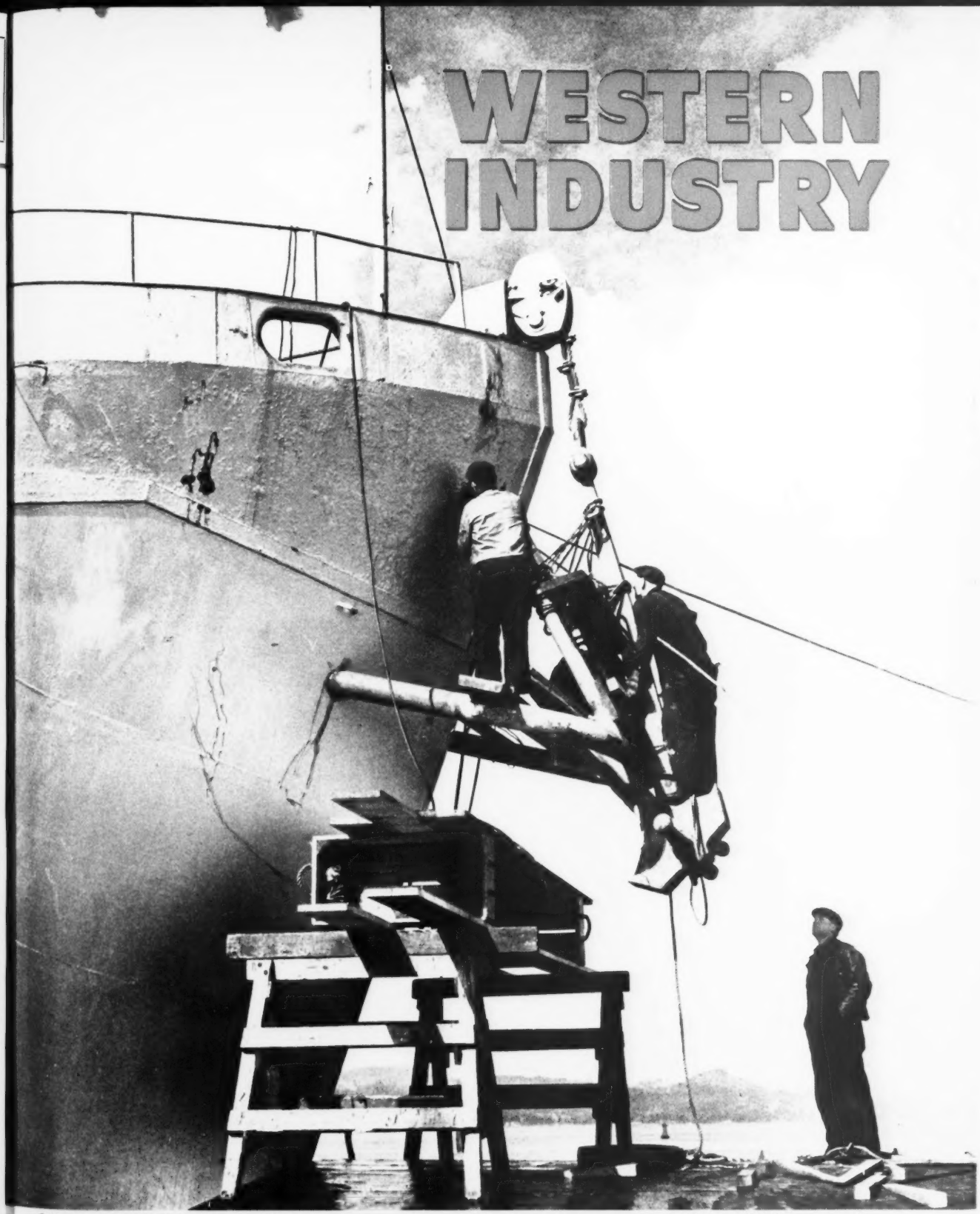
WESTERN INDUSTRY

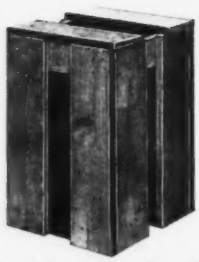


• Modern version of beating swords into plowshares. Making Pacific Ocean tuna boats out of LSTs. For details see page 7.

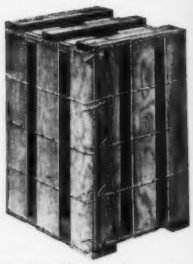
IN THIS ISSUE: *Taking the Curse out of Seasonal Buying and Production Peaks; Cement—Does the Northwest Need More Plants to Make It?; Drawing and Stamping Small Parts to Precision Tolerances; Forged Hoes Competitive with Castings; Quality is Higher; Apprentice Program will Bring "Vanishing Craftsman" Back; Automatic Palletizing Speeds Up Stowing, Cuts Down Confusion.*

Thirty-Five Cents VOLUME XIV NUMBER 6 **June, 1949**

SAVES WEIGHT! ...SAVES TIME!



Nailed crate formerly used. Weight loaded 175 lbs. Packing time, 4 minutes.



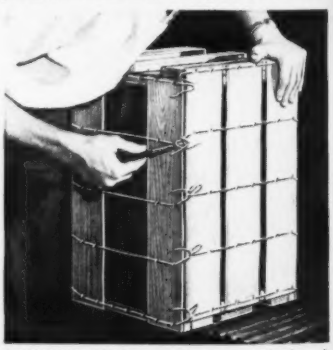
Cabco all-bound container. Weight loaded 150 lbs. Packing time, 1 minute.

CABCO ALL-BOUND CONTAINERS SAVE 25 POUNDS, CUT PACKING TIME 75% ON ELECTRIC MOTOR SHIPMENTS

A 25-pound reduction of actual tare weight! And a 75% saving on packing time! That's how Cabco all-bound wooden containers are helping General Electric Company save on shipments of 3-hp electric motors from its San Jose, Calif. plant. Cabco all-bounds cut packing time from 4 minutes to 1 minute per motor. Shipping weight is reduced 13% over nailed crates formerly used. And Cabco all-bounds (received flat, ready to use) also simplify and speed container handling within the plant on the loading dock and at the destination.

START! 3 hp G. E. motor rolls along assembly line to packing point.

30 SECONDS LATER! Paper cover on, top in place, Cabco all-bound wraps around motor.



1 MINUTE LATER! Container securely closed, motor ready to ship!

IN MANY INDUSTRIES...

...from the equipment manufacturer to the fruit and produce grower, shippers are benefiting from the multiple advantages of Cabco all-bounds. These modern, engineered containers give excellent product protection, often weigh less, require little storage space, are easy to handle, and fold together in seconds without hammer or nails. Cabco all-bounds are made by the West's oldest, foremost manufacturer of wooden containers.

Find out how Cabco all-bounds can help you! Investigate Cabco's container design service. Write direct to exclusive sales agents:

DUFF CALIFORNIA CO.

Sawn Shook, Barrels, Veneer Covers and All-Bound Containers

100 Bush Street, San Francisco 4, California • Telephone SUtter 1-2260
2581 E. Eighth Street, Los Angeles 23, Calif • Telephone ANgelus 1-4161

1921

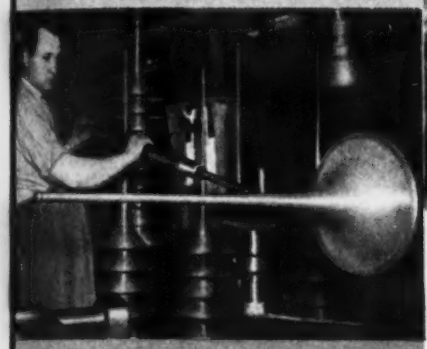
CALIFORNIA BARREL COMPANY, LTD.

OFFICES: SAN FRANCISCO, LOS ANGELES and ARCATA, CALIFORNIA
SALT LAKE CITY, UTAH • PLANTS: ARCATA, SAN FRANCISCO, LOS ANGELES

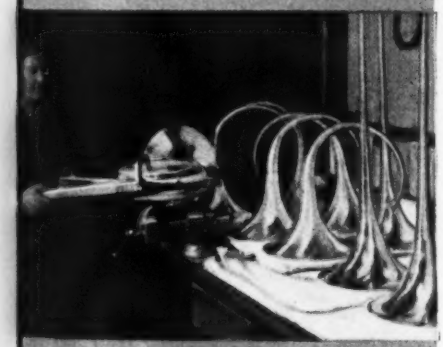
CABCO CONTAINERS

THIS IS OUR 66TH YEAR

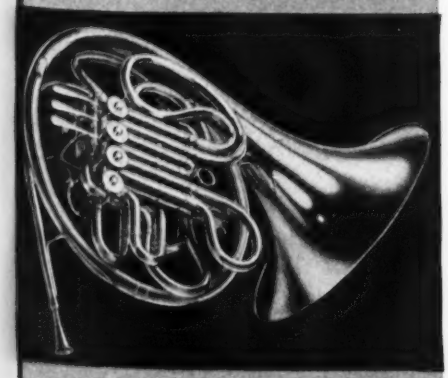
Forming the bell of a French horn is a highly skilled operation in which the bell bottom is spun from a flat disc of brass. Not only is the bell shaped, but the metal thickness is reduced.



The stem is formed from cartridge brass strip, 11" wide x .0179" thick. It is brazed on the seam and then brazed to the bell. The final spinning operation is over a tapered mandrel.



To obtain a uniformly smooth contour, both inside and out, the bell and stem are filled with pitch before bending on this bench fixture.



Skipping several hundred operations, we come to the finished instrument. It is now checked for pitch on the Conn Electronic Tester that measures tonal accuracy to 1/100th of a semi-tone.

It's BRASS that makes the Band!

When Col. C. G. Conn, the colorful Elkhart grocer who played in the town band, abandoned the cracker barrel for the tuba and the trombone in 1875, he bent his first horns to shape around tree trunks. But he started the industry that has made this nation the most musical on earth . . . a nation of three million young musicians, of 30,000 school bands and 35,000 school orchestras.

Since those early days, throughout the evolution of the Conn factory from a board shack to the largest and most modern in the world, Conn Instruments have been made from Brass and Nickel Silver supplied by The American Brass Company.

Well-known to both musicians and metal craftsmen are the many advantages that make brasses and other copper alloys indispensable for musical instruments. Only these metals can produce the tonal qualities desired . . . and only their ductility and ready workability can produce the flowing curves, the graceful tapers and glistening bells of modern band instruments.

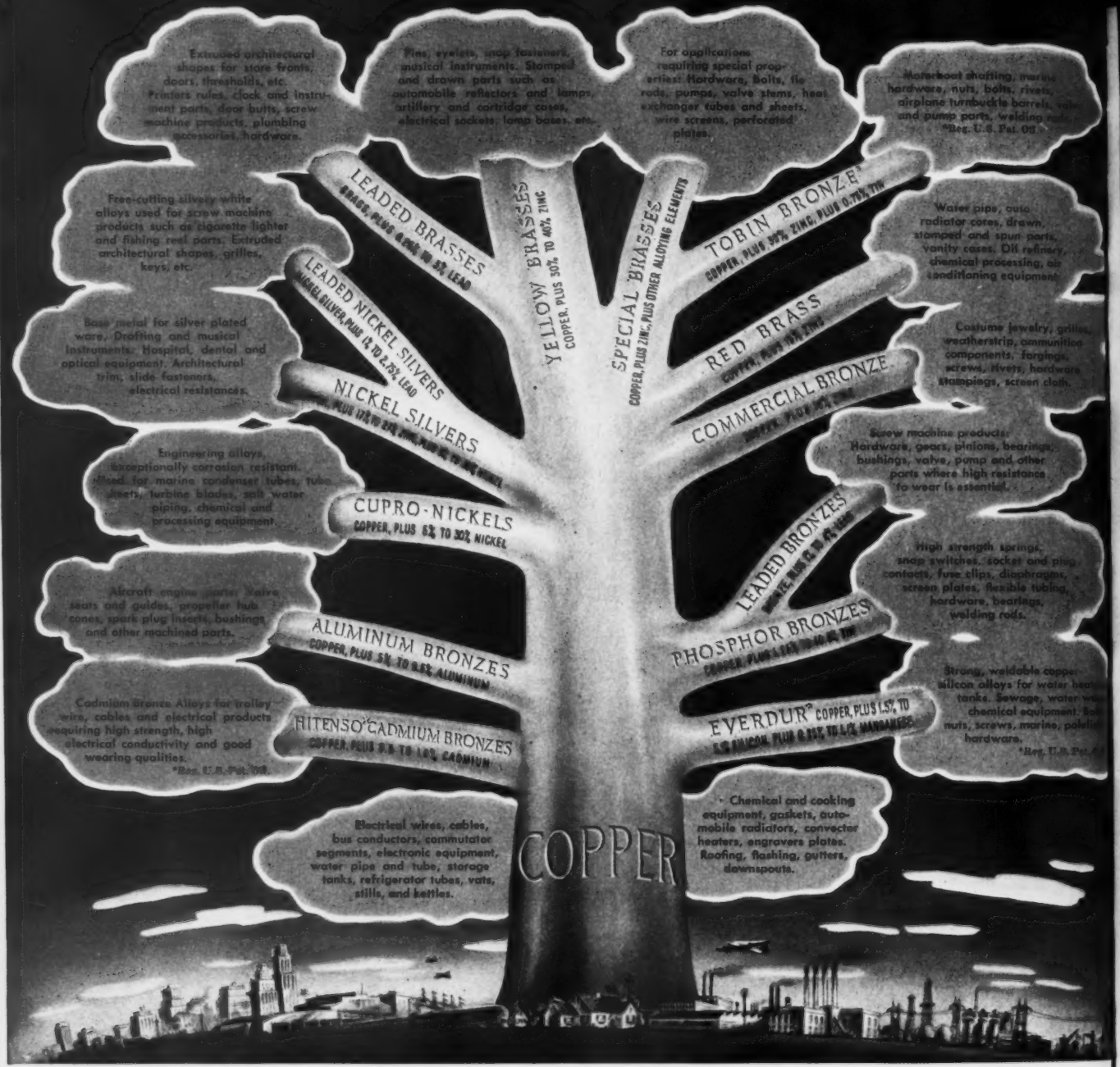
"We have always found," writes Conn, "the copper alloys furnished by The American Brass Company to be consistently uniform in the properties so essential to our operations. And when we say this, it should be borne in mind that our standards of material testing and tonal precision are without equal in our field."

Uncompromising metal standards such as those set by C. G. Conn Ltd. are the expected thing in industry after industry specifying Anaconda Copper and Copper Alloys. How varied these industries are, and the alloys they require, are graphically indicated on the next page.

ANACONDA

THE AMERICAN BRASS COMPANY

General Offices: **Waterbury 88, Connecticut**


Extruded architectural shapes for store fronts, doors, thresholds, etc. Printers rules, clock and instrument parts, door butts, screw machine products, plumbing accessories, hardware.
Pins, eyelets, snap fasteners, musical instruments. Stamped and drawn parts such as automobile reflectors and lamps, artillery and cartridge cases, electrical sockets, lamp bases, etc.
For applications requiring special properties: Hardware, bolts, tie rods, pumps, valve stems, heat exchanger tubes and sheets, wire screens, perforated plates.
Motorboat shafting, marine hardware, nuts, bolts, rivets, airplane turnbuckle barrels, valve and pump parts, welding rods. *Reg. U.S. Pat. Off.
Free-cutting silvery white alloys used for screw machine products such as cigarette lighter and fishing reel parts. Extruded architectural shapes, grilles, keys, etc.
LEADED BRASSES
BRASS, PLUS 0.25% TO 3% LEAD
YELLOW BRASSES
COPPER, PLUS 30% TO 40% ZINC
SPECIAL BRASSES
COPPER, PLUS ZINC, PLUS OTHER ALLOYING ELEMENTS
TOBIN BRONZE*
COPPER, PLUS 59% ZINC, PLUS 0.75% TIN
Water pipe, auto radiator cores, drawn, stamped and spun parts, vanity cases. Oil refinery, chemical processing, air conditioning equipment.
LEADED NICKEL SILVERS
NICKEL SILVER, PLUS 1% TO 2.75% LEAD
RED BRASS
COPPER, PLUS 15% ZINC
Base metal for silver plated ware. Drafting and musical instruments. Hospital, dental and optical equipment. Architectural trim, slide fasteners, electrical resistances.
COMMERCIAL BRONZE
Costume jewelry, grilles, weatherstrip, ammunition components, forgings, screws, rivets, hardware stampings, screen cloth.
NICKEL SILVERS
Screw machine products. Hardware, gears, pinions, bearings, bushings, valve, pump and other parts where high resistance to wear is essential.
Engineering alloys, exceptionally corrosion resistant. Used for marine condenser tubes, tube sheets, turbine blades, salt water piping, chemical and processing equipment.
CUPRO-NICKELS
COPPER, PLUS 5% TO 30% NICKEL
LEADED BRONZES
High strength springs, snap switches, socket and plug contacts, fuse clips, diaphragms, screen plates, flexible tubing, hardware, bearings, welding rods.
Aircraft engine parts: Valve seats and guides, propeller hub cones, spark plug inserts, bushings and other machined parts.
ALUMINUM BRONZES
COPPER, PLUS 5% TO 9.5% ALUMINUM
PHOSPHOR BRONZES
Cadmium Bronze Alloys for trolley wire, cables and electrical products requiring high strength, high electrical conductivity and good wearing qualities. *Reg. U.S. Pat. Off.
HITENSO* CADMIUM BRONZES
COPPER, PLUS 0.5 TO 1.0% CADMIUM
EVERDUR* COPPER, PLUS 1.5% TO
Strong, weldable copper-silicon alloys for water heater tanks. Sewage, water and chemical equipment. Bolts, nuts, screws, marine, pole line hardware. *Reg. U.S. Pat. Off.
Electrical wires, cables, bus conductors, commutator segments, electronic equipment, water pipe and tube, storage tanks, refrigerator tubes, vats, stills, and kettles.
COPPER
Chemical and cooking equipment, gaskets, automobile radiators, convector heaters, engravers plates. Roofing, flashing, gutters, downspouts.

Copper is the trunk of an indispensable family tree

The copper family of alloys is versatile, indeed. These dependable metals have contributed to the development of practically all technical and industrial progress. Other metals may have more distinctive properties. Chromium is harder; magnesium is lighter; silver has higher conductivity. But . . . of all commercial metals, copper and its alloys *combine to best advantage* a range of physical and chemical properties not found in any other group.

These properties include a high degree of corrosion resistance; high tensile strength and fatigue resistance; ductility, hardness and toughness; ready weldability; resistance to abrasion; hot or cold workability; machinability, and high thermal and electrical conductivity.

Yet, these very properties, singly or in combination, can be varied considerably by metallurgical adjustment of composition and by changes in the technique of fabrication.

Our Technical Department will be glad to work with you in selecting the best metal for a specific application. 48123

ANACONDA THE AMERICAN BRASS COMPANY
General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

Anaconda Copper Alloys

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Coal Briquetting Conference at Laramie

A coal briquetting conference will be held at the University of Wyoming, Laramie, June 24 and 25, sponsored by the Natural Resources Institute of the university.

Coal producers, coal technologists, plant operators, equipment manufacturers, marketing specialists, and asphalt research chemists will be in attendance. Three half-day sessions on plant operation, binder developments, and carbonizing techniques are planned, together with a dinner on the evening of June 24, and participation in a wild-game steak fry (moose, antelope, buffalo, and elk) on Saturday afternoon, June 25. The program will include talks by experts in the various fields as well as ample opportunity for informal discussions.

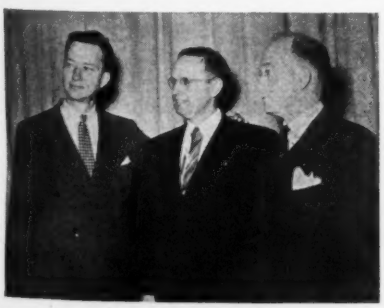
Details relative to the conference and reservations in local hotels or auto courts may be had from Dr. C. C. Boley, Coal Research Engineer, Natural Resources Research Institute, Laramie, Wyoming.

Many Features For Industrial Exposition

The second Bay Area Industrial Exposition, to be held in the Oakland Municipal Auditorium from June 4 to June 12, will include meetings held by organizations sponsoring particular days. Among these are:

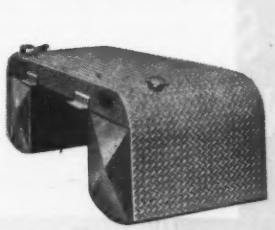
Industrial Editors' Association, Monday, June 6; the Purchasing Agents' Association of Northern California, Tuesday, June 7; the San Francisco Sales Managers Association, Wednesday, June 8; the California Manufacturers' Association, Thursday, June 9; the American Society of Mechanical Engineers, featuring a Materials Handling Day, Friday, June 10; the Small Industries Association of Northern California, Saturday, June 11.

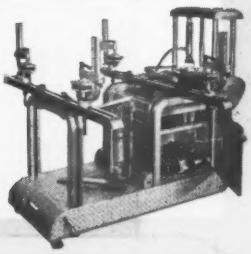
All available exhibit space in the Exposition building has been leased and many additional booths are expected to be erected in the Auditorium, according to Alden Stock, President of the BAIE. Arrangements have also been made for the demonstration and display of heavy-duty industrial and transportation equipment in the outdoor area of the Auditorium.



• Three of the top Bay Area Industrial Exposition officers shown above are, left to right: Alden Stock, president; Oscar H. Fisher, Jr., chairman of the board; Heath Angelo, Jr., Oakland representaive.

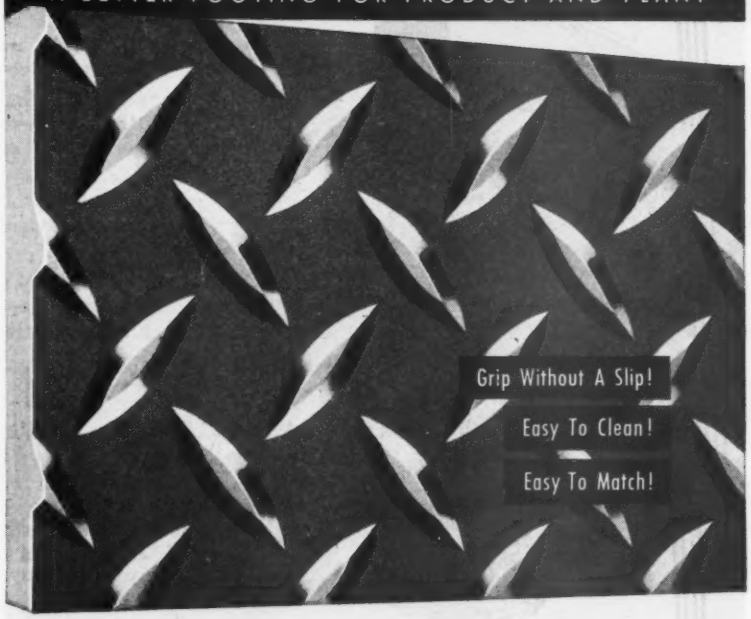
You're Always Safe and Safe ALL Ways On





AW SUPER-DIAMOND FLOOR PLATE

A BETTER FOOTING FOR PRODUCT AND PLANT



Install AW Super-Diamond Floor Plate in your plant and say goodbye to costly slipping accidents and floor maintenance bills. The exclusive engineered pattern provides maximum skid resistance regardless of how the plate is laid or the angle from which it is approached. More and more architects are specifying AW Super-Diamond Floor Plate, and leading Product Designers are using it for machine tool bases, saddle tanks and similar products on which men walk and climb. For safety's sake specify AW Super-Diamond Floor Plate for your plant and products. Write for more information and 16-page, fact-packed catalog.

AW SUPER-DIAMOND

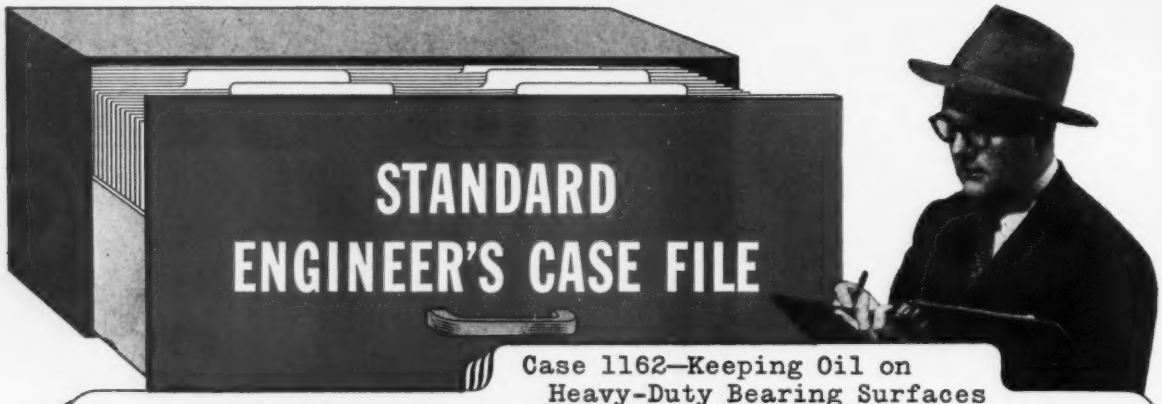
FLOOR PLATES THAT GRIP

FREE—16-Page Catalog L-32. Write for your copy now.

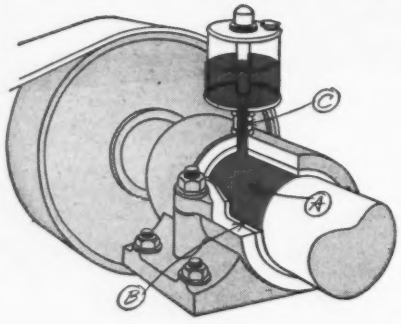
A Product of ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PENNA.

OTHER PRODUCTS: Permaclad, Stainless Clad Steel • AW Super Grip, Abrasive Floor Plate • Billets • Plates • Sheets (Alloy and Special Grades)



Case 1162—Keeping Oil on Heavy-Duty Bearing Surfaces



SHAFT BEARING

Adhesive Calol Vistac Oil reduced oil consumption and wear on bearings operated under constant heavy shock loads. Recommended for all plain bearings, table slides, air tools and enclosed industrial reduction gear sets. Comes in six grades: 9X, 14X, 19X, 28X, 36X, 45X — SAE 10 to SAE 50.

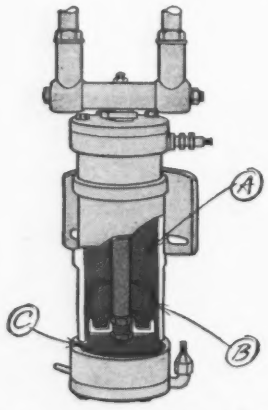
A. Extremely viscous and tacky and sticks tight under pounding — prevents metal-to-metal contact and reduces leakage waste.

B. Contains extreme pressure stringiness and oiliness additives . . . tough lubricating film remains intact in wide range of temperature conditions.

C. Small quantity provides adequate lubrication.

Calol Vistac Oil may be applied by forced feed, gravity, and sight-feed cup lubricators; the lighter grades by wick- and ring-oilers.

Case 1148A—Eliminating Deposits in Hydraulic Systems



MACHINE TOOL HYDRAULIC-FEED CYLINDER

Calol OC Turbine Oil, as the hydraulic medium in machine tool feeds, and lifts, will not deteriorate. In use as long as four years, it was only necessary to replace oil lost by leakage. Also recommended for steam turbines. Comes in four grades: 9, 11, 15, 19.

A. Contains very effective oxidation inhibitor — will not form deposits . . . same charge has been used in turbine as long as four years without trace of acidity.

B. High metal-wetting ability and corrosion inhibitor prevents rusting and pitting.

C. Separates readily from water or other contaminants — dirty oil may be reclaimed easily.

In turbines, the corrosion inhibitor in Calol OC Turbine Oil assures protection against rusting even during the critical initial operating period.

Trademark Reg. U. S. Pat. Office

STANDARD TECHNICAL SERVICE will make your maintenance job easier. If you have a lubrication or fuel problem, your Standard Fuel and Lubricant Engineer or Representative will gladly give you expert help; or write Standard of California, 225 Bush St., San Francisco 20, California.

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This Month in WESTERN INDUSTRY

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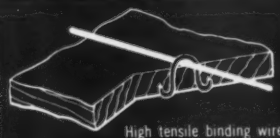
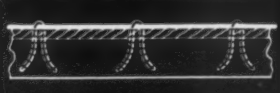
Front Cover

"Freeze-ships," some of them converted LSTs, to process fish in distant waters, are a big postwar tuna industry development. Scene shows bow ramp of the former LST "Tinian" being sealed up at the Willamette Iron & Steel Corporation, Portland, preparatory to delivery to Columbia River Packers Assn., Astoria.

2200 lb. stokers ship safer in WIREBOUNDS



High tensile binding wire is stapled to face sections; staples go completely through and are clinched with the points fully imbedded for maximum strength.



Staples in cleats are driven in such a way that the ends flare after entering the wood . . . thus increasing the resistance to pull-out.

SAVE OVER 50% ON CONTAINER WEIGHT

The versatility of the Wirebound construction principle—the strength of steel with thinner wood—never has been more clearly demonstrated than by the crates specially designed to carry 2,200 pound commercial self-feed stokers manufactured by a well known mid-west producer.* These giant Wirebounds measure 114" x 60" x 36" and are composed of a heavy skid-type base, wrap-around mat and top weighing 218 pounds—282 pounds lighter than the wooden container previously used. The 7/32 inch veneer mat—reinforced with high tensile steel wire—was engineered specifically to reduce shipping damage by affording greater protection. The flexibility of the crate so increases its resistance to the shocks and jars of handling and shipping that these huge stokers are now delivered completely intact, without damage. So whether your shipping problem is "king-size" or compact, a strong, resilient Wirebound can be designed to deliver your goods safely and at lower cost. Get full details today—use the handy coupon below!

WIREBOUND BOX MFRS. ASS'N.

Room 606, 503 Market St., San Francisco 5, Cal.

☐ SEND COMPLETE LITERATURE
☐ SEND A SALES ENGINEER

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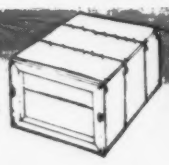
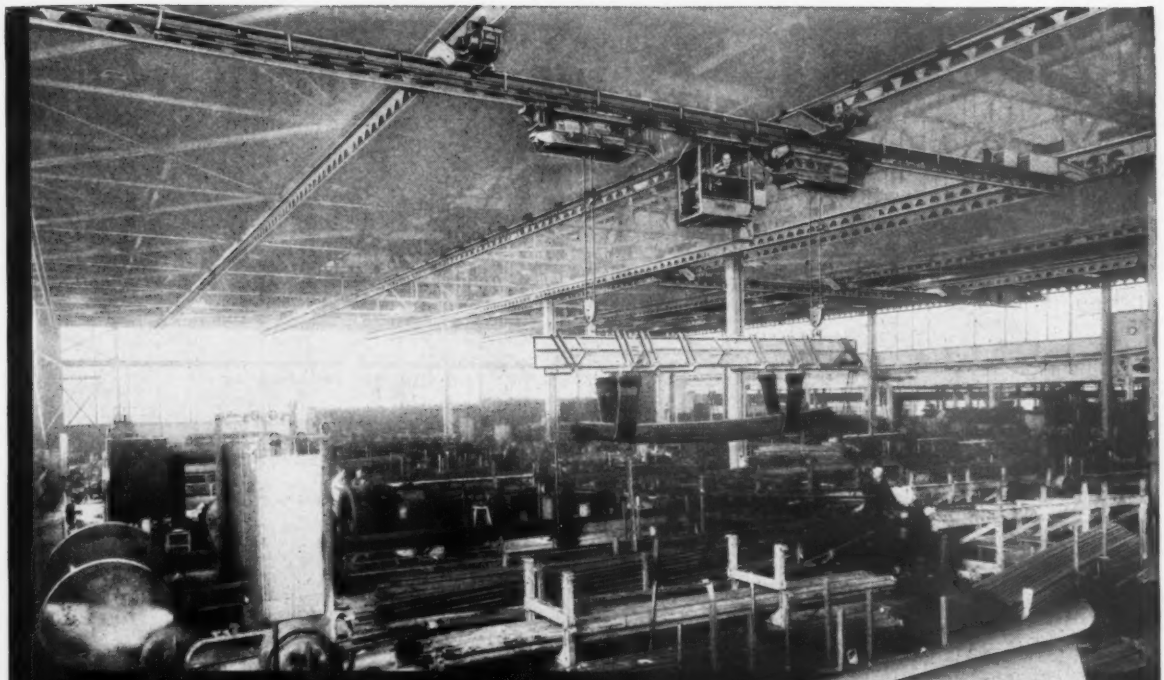
PRODUCT



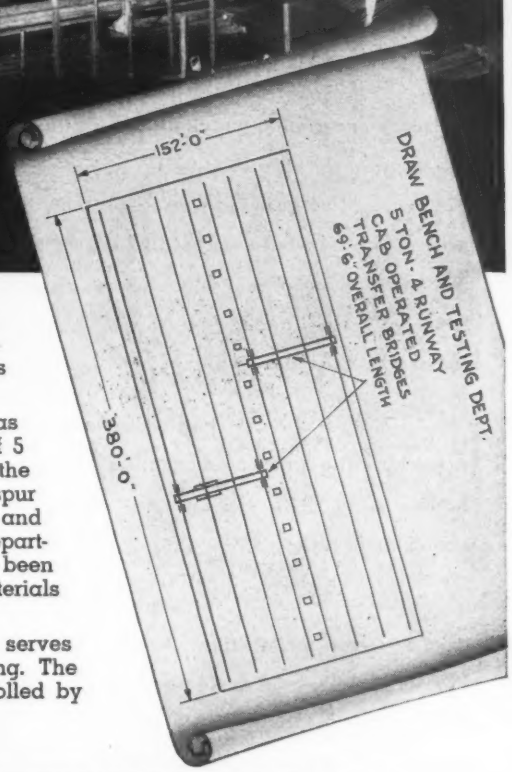
*Name on request.

Wirebound
BOXES & CRATES

SIXTY WIREBOUND PLANTS THROUGHOUT THE UNITED STATES



5 TON INTERLOCKING TRANSFER BRIDGES CUT HANDLING TIME



Careful planning in adapting the proper materials handling equipment to serve the large draw bench and testing department of a prominent copper company has paid real dividends because of resulting efficiency.

Instead of employing standard overhead traveling cranes as originally considered, two 4-runway transfer bridges each of 5 ton capacity are used, one on each side of the columns in the middle of the room. The bridges interlock with a short spur enabling a cab-operated carrier to travel from one to the other and provide complete materials handling coverage of the entire department. Thus time-consuming rehandling that would have been required with standard overhead cranes, in transporting materials from one bay to the other is eliminated.

The single cab-operated double-hoist carrier adequately serves the whole department and carries tubing up to 40 feet long. The carrier as well as the transfer bridges are completely controlled by the operator in the cab.

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BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
8834 East 284th Street, Wickliffe, Ohio

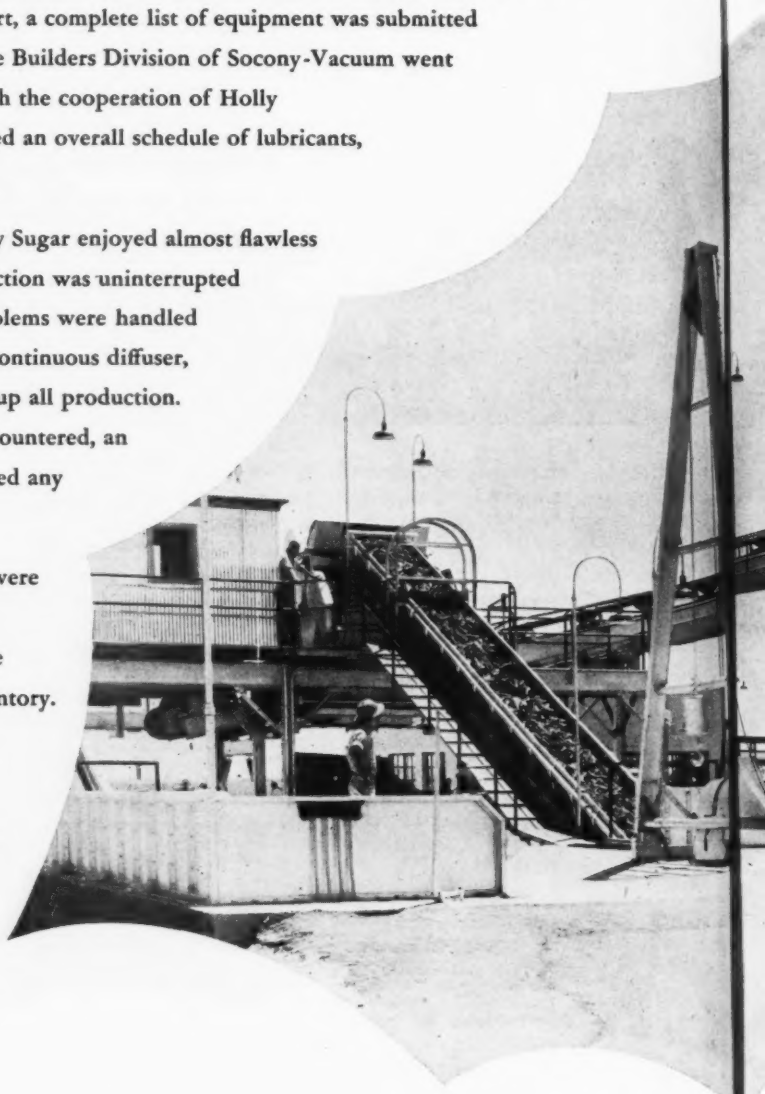
CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Engineered Lubrication Results in a

Sweet Performance

When the Holly Sugar Corporation contemplated building its new modern plant near Brawley, California, good planning gave lubrication equal consideration with other major problems. From the start, a complete list of equipment was submitted General Petroleum engineers. The Engine Builders Division of Socony-Vacuum went to work with machinery builders and with the cooperation of Holly superintendents G. P. engineers established an overall schedule of lubricants, service periods and application methods.

As a result, Holly Sugar enjoyed almost flawless performance of all equipment and production was uninterrupted throughout the season. How specific problems were handled is illustrated by gear lubrication on the continuous diffuser, where conveyor failure would have held up all production. When problems of severe loads were encountered, an especially compounded lubricant prevented any wear at these critical points.



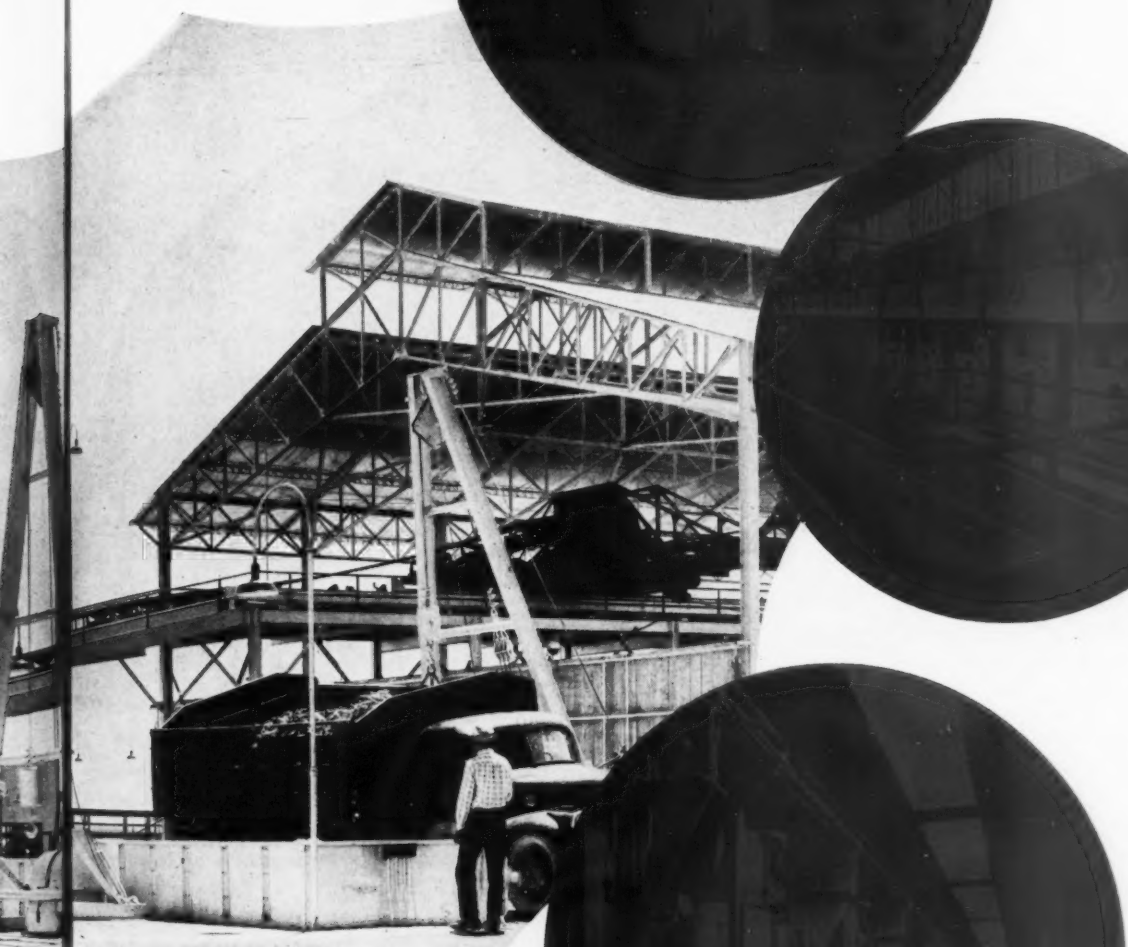
Further savings were made by using a minimum number of lubricants for all equipment, reducing the problems of ordering, handling and inventory.

Your plant can have a "sweet" production record, too, with the help of G. P. products and engineering service. Just call your nearest G. P. distributor or branch, and an experienced lubrication engineer will help solve your problems.

GENERAL PETROLEUM CORPORATION

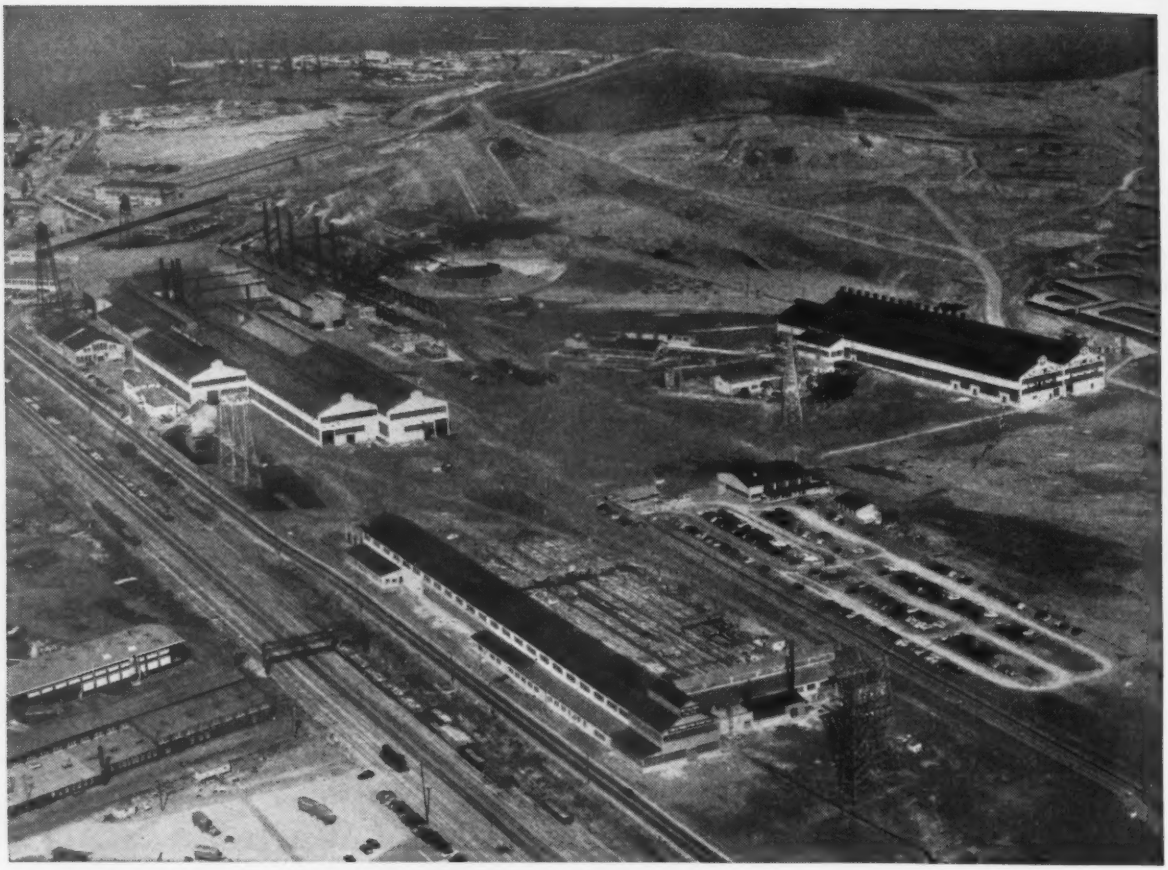
A Builder in the West since 1898

e Record



Mobiloil

SOCONY-VACUUM



Bethlehem Pacific's South San Francisco plant at East Grand Avenue and Industrial Way.
During the past eight years the steelmaking capacity of this plant has increased 50 pct.

A Modern Steel Plant in the Bay Area

One of Bethlehem Pacific's three steelmaking plants is located at South San Francisco in the heart of the Bay Area.

Complete with open-hearth furnaces, finishing mills and manufacturing equipment this plant is a convenient source of many steel products for industrial users and jobbers in the West.

Here 235,000 tons of steel per year are produced and converted into bars, rods, structural sections and miscellaneous shapes. An integral section of the plant is devoted to the manufacture of bolts, nuts and allied steel fastenings. Another important division is equipped to fabricate steel transmission towers.

Bethlehem Pacific also operates complete steelmaking plants at Seattle and Los Angeles in addition to fabricating works at Alameda and Los Angeles. These units are all directed and coordinated by a single organization whose aim is to produce more steel and more steel products for Western Industry.

★ BETHLEHEM STEEL ★

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Honolulu

BETHLEHEM PACIFIC

Your compressors deserve this protective lubrication

CHECK THESE QUALITIES OF SHELL CLAVUS OIL

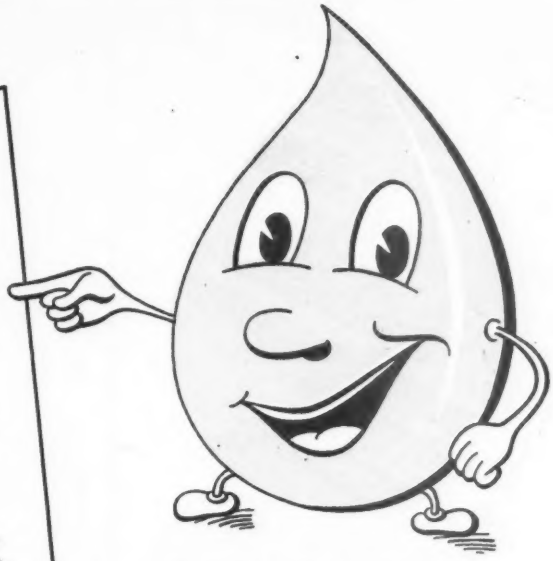
KEEPS DOWN CARBON — Shell Clavus Oil not only forms a minimum of carbon but that minimum is also soft... harmless. Valves stay clean and free working.

KEEPS DOWN GUMS—because this oil has all the unstable compounds removed.

ON THE JOB . . . HOT OR COLD — always ready to flow. No "dry starts" even in cold weather.

NON-FOAMING — soap-like compounds that cause foaming are taken out of Shell Clavus Oil by a special clay filtering process.

Shell Clavus Oil is the result of exhaustive study of compressor operation. It matches the job in every way, gives your compressors *protective* lubrication. Use it with confidence, for trouble-free service.



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SHELL CLAVUS OIL

for your needs in FASTENERS look to "NATIONAL"

Wood Screws • Machine Screws • Nuts
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Machine Bolts • Cotter Pins

Other *"National"* Products:
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The Complete, Quality Line

You can buy all your headed and threaded fasteners from one dependable source when you order from "National". For standard bolts, nuts and screws, or special fasteners to meet your individual problems, "National Screw" has the facilities and the know-how to take care of your requirements.

Let us supply you with the right fasteners to make your products fit better, stay tighter, operate more smoothly.

Your people will find "National" fasteners, in their clearly labeled packages, easy to stock and handle.

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PRODUCTS

NATIONAL SCREW & MFG. CO. OF CAL.
3423 So. Garfield Ave., Los Angeles 22, Cal.

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Touch it and it bleeds–OIL!

OIL saturated felt bleeds at a touch. A slight pressure, or the mere rotation of a shaft, is enough to deliver a light film of oil where it is needed, as it is needed. This effect of oil storage capacity and capillary action is just one of felt's many advantages when used as a seal. Positive retention of the lubricant made possible by laminated *Oil Foil* seals is an added plus.

Illustrated below is an *Oil Foil* seal, a sandwich of two layers of felt and two impervious septums of Hycar, the whole bonded firmly together. Seals such as this are produced by American Felt to the exact dimensions required, and with from one to three septums. Hycar is recommended for its resistance to oils, greases and solvents. Natural rubber and various synthetics can also be specified to meet special conditions. For illustrative samples and complete technical information, write for Data Sheet No. 11, "Felt Seals, Their Design and Application"—an authoritative reference on this important subject. And when ordering felt for seals or other uses, *be sure it is American Felt*.

American Felt Company

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The Largest and Most Complete Stock in the West

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1849 100 Years of DUCOMMUN Progress 1949

boiler, stainless aluminum, br ing. For call KI

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IN OUR MAILBOX

Pulling Power

Editor, Western Industry:

Thank you very much for running the story of our summer courses, or conferences, in the April issue of "Western Industry." We were pleased to see the story in print.

As a result of this and other announcements which we made directly, we received an encouraging number of registrations.

ROBERT D. GRAY
California Institute of Technology
Industrial Relations Section
Pasadena, Calif.

Never Grows Old

Editor, Western Industry:

We are informed that your February issue contains a timely and interesting article entitled, "Coast Fertilizer Industry Shows Rapid Growth."

Will you please send us a copy of this particular issue? We are endeavoring to show that the fertilizer industry all over the country has expanded to meet agricultural needs and we are sure that the information contained in your article would be very helpful.

CEDRIC G. GRAN
Assistant to the President
American Plant Food Council, Inc.
Washington, D. C.

Shows the Trend

Editor, Western Industry:

The tabulation of wage changes which you have just instituted will, it appears to us, be of considerable value in showing the trends. The actual rates paid either before or after the change, would add greatly to the value for purposes of comparison, but obviously specific job rates can be given only in occasional instances in a tabulation of this kind and "average rates," unless calculated according to a single specific method, can be more misleading than helpful.

L. H. JONES
Industrial Relations Director
United State Potash Company
Carlsbad, New Mexico

Attention Getter

Editor, Western Industry:

The article in your magazine regarding "Disposable Paper Pallets Save Time, Money and Goods" has come to my attention. I wish to inquire if it would be possible to obtain five reprints of this article, and if they are not available, I would appreciate obtaining two issues of the magazine.

DON A. WILLHITE, Dist. Super.
Accident Prevention Bureau
Waterfront Employers Assn. of the Pacific Coast.
Portland, Oregon

(Continued on Page 19)

EDITORIAL COMMENT

More Distribution Business

TWO things of outstanding importance to the West are being done by the city of Rochester, New York.

The first is offering a service to manufacturers by locating for them responsible wholesalers, jobbers, or manufacturers' representatives to cover western and central New York territories. As distribution is a difficult problem for most manufacturers, and costly even in its preliminary stages, when the right representative has to be selected in parts of the nation far removed from the parent plant, this service is highly valuable to the manufacturer himself. But it is also exceedingly helpful to those engaged in distribution operations in the Rochester territory to have someone out helping to drum up additional lines for them to handle.

The second part of the Rochester program is directed at West Coast industry. It has been found that many fine West Coast products have been kept from the Eastern markets because of the high freight rate involved, and Rochester is suggesting that West Coast manufacturers explore the possibility of having responsible Rochester plants produce their Western items, package them according to specifications, and ship them to their Eastern accounts.

Conversely, Rochester has found that some of its own manufacturers might consider having their products made for them on the West Coast in order to fill certain demands now beyond their scope.

As the idea is not patented, it might well be picked up and used by communities in the West.

We're Still Not Convinced

A Montana banker does not altogether agree with a *Western Industry* editorial of a few months back entitled "What use is the RFC?"

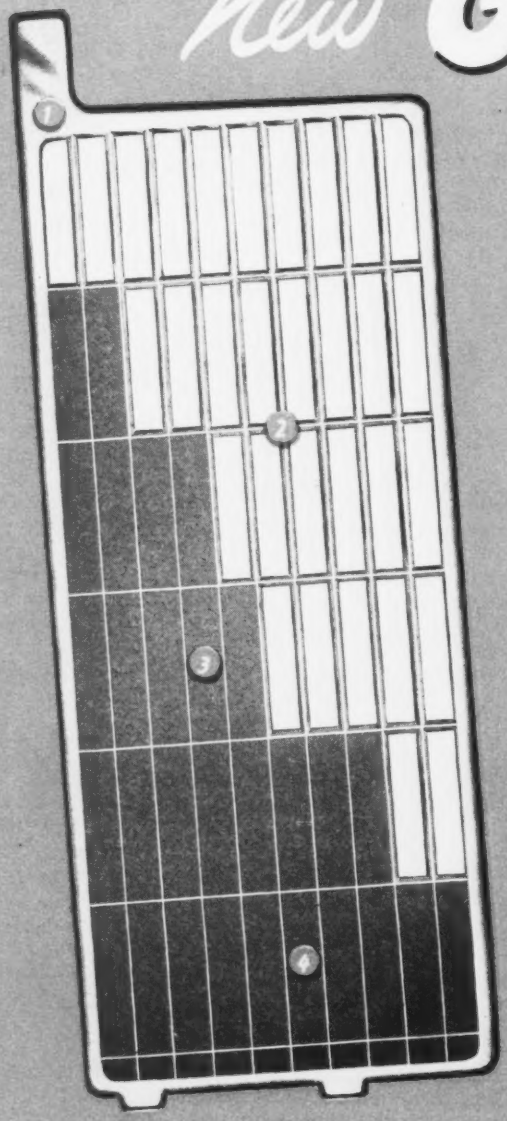
"I cannot say that there is not a place for the RFC," he writes. "My observation of the loans made by the Corporation covers a small area, of course, and while there are several of them that it is difficult for me to justify or understand, yet many are worthwhile and self-liquidating, serving useful purposes, and unless financed by such an organization I do not know where credit could be obtained.

"One thing I am afraid of about the RFC is the fact that their officials, both at headquarters and in the several districts, are subject to so much political pressure that they are driven into loans, whereas if they could use their own judgment they would not have been made. This is admitted by the Corporation officials in this district, at least.

"Many banks would also disagree with me in that I think there is a place for the Production Credit Association offices. They are the strongest competitors we have, and are probably making more livestock loans than all the banks in this town put together, and yet I believe there is a place for them. They are more liberal than banks can be and the time may come that they will be operating at a loss, but I believe they have served a useful purpose and stockgrowers are being taken care of profitably, whereas we would have felt the loans were too heavy and would not have taken them on."

This banker certainly has given an impartial, fair-minded opinion. But the question still remains, why should the government be financing farmers or stockgrowers, any more than it should shoe stores or struggling lawyers or dentists?

New GOULD "Z" Plate



REVOLUTIONIZES BATTERY DESIGN!

Only GOULD Has It!

A revolutionary new plate design greatly improves battery performance. The new Gould "Z" Plate means that Gould batteries stay new longer! Here's why:

1. Solid, non-porous positive grid.
2. All grid members are heavy with same cross section.
3. Regenerative oxide renews itself throughout battery service.
4. More active material per battery pound.

Brand new from Gould's modern laboratories and pilot plant. Available shortly in all "Thirty" and "Kathanode" types. Ask for literature on how Gould's new casting techniques improve battery performance.

The Gould "Thirty"
More than ever—America's
Finest Industrial Truck Battery.

GOULD

STORAGE BATTERY CORPORATION

TRENTON 7, NEW JERSEY

Always Use Gould Automobile and Truck Batteries

MAIL BOX *(Continued from Page 17)*

Fountain of Wisdom

Editor, Western Industry:

We are making reference to an article entitled, "Quick Quenching of Molten Rock to Make Fertilizer" published in the October issue of *Western Industry* (pg. 48).

The product mentioned appears to have great promise and we therefore would like to obtain further information about it.

In the first paragraph you mention the Manganese Products, Inc., of Seattle, Washington, as being the second in the nation to produce this material. From your bibliography can you supply us with the name and address of the other producer?

It is hoped that you can furnish us with this information at your earliest possible convenience.

G. DiGeronimo
Research Department
Ferro Enamel Corporation
Cleveland, Ohio

Educational Plan For Employees

Tide Water Associated Oil Company is making a post-war investment in their employees. Effective immediately, the company will wholeheartedly encourage and financially assist their Western division employees desiring to better their work with the firm by taking approved educational courses.

All regular employees, both male and female, with six months or more continuous company service, are eligible to take advantage of this plan, which is under the jurisdiction of Gardiner Blackman, manager of industrial relations.

This program follows generally the plan heretofore adopted for employees in the eastern and mid-continent divisions. Individuals are allowed the opportunity to complete all arrangements for courses of study of value to them in their jobs. Further, it provides for personal selection of accredited educational institutions.

Upon presentation of diploma or certificate showing completion in a course of study, the company will reimburse the employee with a sum of money equal to one-half the cost of tuition fees.

Steel Batting Average

California, apart from national leadership in capacity for making concrete reinforcing bars, says the American Iron and Steel Institute, is sixth in merchant bar capacity, sixth in merchant wire rods, seventh in hot rolled strip, seventh in heavy structural shapes, fourth in light structural shapes, and ninth in plates and nails and staples. Other states ranking among the top ten in capacity for selected high tonnage finished steel products include: Colorado, heavy and light structural shapes and nails and staples; Utah, plates, and heavy structural shapes.

QUICK

Pipe Reaming

THAT SAVES PIPE

RIDGID
Extra-Long-Taper Reamer won't thin, flare or split pipe

● Secret of the RIDGID's safe easy reaming is its extra long taper. With a few light ratchet turns, you whisk the burr from pipe or conduit without fear of thinning, flaring or splitting. You save time, work *and* pipe. Two sizes: No. 2, ⅛" to 2"; No. 3, ⅜" to 3." No. 2 reamer unit available without ratchet handle for use in RIDGID No. 00R threader handle. Ask your Supply House.

Reamer unit fits RIDGID No. 00R Ratchet Handle.

RIDGID
WORK-SAVER PIPE TOOLS
THE RIDGE TOOL CO. • ELYRIA, OHIO

IMPORTANT NEWS!
for users of Aluminum
United States Steel Supply Company
has added aluminum to its line of products
Warehouses of the United States Steel Supply Company are now arranging to carry in stock a complete line of aluminum mill and building products manufactured by the Reynolds Metals Company.
This is further indication of the far-reaching expansion program of United States Steel Supply Company and its desire to satisfy more completely the metal requirements of its customers.
Initially, aluminum mill products — such as structurals, bars and sheets are stocked at the firm's Los Angeles, San Francisco, and Chicago warehouses.
Aluminum building products such as corrugated sheets, siding and other materials are in stock at Newark, Baltimore, Chicago, St. Paul, Milwaukee, St. Louis, Los Angeles and San Francisco warehouses.
Experienced technicians will be at customers' disposal at all times to help with problems involving application or fabrication.
UNITED STATES STEEL SUPPLY COMPANY
USS
STEELS
SERVICE
SYMBOL OF SERVICE
Contact our nearest warehouse or sales office whenever you need steel--or aluminum
UNITED STATES STEEL SUPPLY COMPANY
SAN FRANCISCO (1), P. O. Box 368, 1940 Harrison St., MArket 1-4988, ENterprise 1-0017 (Trans-Bay Only)
LOS ANGELES (54), P. O. Box 2826—Terminal Annex, 2087 E. Slauson Ave., LAfayette 0102
SEATTLE (4), Washington, Cor. 3rd So. & Lander St., Elliott 3014
PORTLAND (10) ORE., 2345 N.W. Nicolai St., CApitol 3283
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CLEVELAND · LOS ANGELES · MILWAUKEE · MOLINE, ILL. · NEWARK · PITTSBURGH
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Also Sales Offices at: KANSAS CITY, MO. · PHILADELPHIA · TOLEDO · TULSA · YOUNGSTOWN
USS
UNITED STATES STEEL

Gradual easing off in industrial activity; Small oil refiners in tight spot; Steel mills continue at full tilt despite softening market; aircraft plants plenty busy; Heavy canning crops ripening; Apparel looks up.

INDICES and production reports show a moderate slowing down of industrial activity in the West, with the level somewhat below comparable dates last year and evidences of a continued easing off in the next few months.

Manufacturing employment as of March for the three Pacific Coast states was only 41,000 below March, 1948, and the winter decline that had been going on for several months stopped at that point. Insured unemployment also halted there, but on the other hand a number of big manufacturing layoffs began to appear in late April and early May which will not be reflected in statistics until later on.

Business activity indices as reported in an adjoining column showed an upturn in Arizona and southern California in March, but carloadings are below last year's records, although truck movement is on the increase. Department store sales are down and so are bank loans. Bank deposits, however turned upward in March.

Wholesalers' sales in nearly all lines, as reported in the figures below, have been below a year ago, beginning late last fall.

The trend in wage contracts is toward renewal at the old rates, although unions have obtained increases in various crafts throughout the West. Outside of the difficulties at Kennecott Copper Corporation in Utah, the West was generally clear of serious strikes at the time of going to press.

Business Activity Indexes in Per Cent of 1935-1939 Average

(Taken as basis of 100)

	Jan. '49	Feb. '49	Mar. '49
[1]Arizona	315.2	318.3	328.7p
[2]California	221.1	214.2	218.6p
[3]So. California	269.7	262.5	265.4p
[4]Pacific N.W.	223.0p (up 2.7%)		
[4]Puget Sound	215.6 (up 2.3%)		
[4]Inland Empire	207.1 (up 4.2%)		
[4]L. Columbia	239.8p (up 1.4%)		

1) Valley National Bank (Phoenix) index, based on a weighted composite of retail sales, agricultural income, and employment in mining, manufacturing and construction, and seasonally adjusted. 1940 = 100.

2) Wells Fargo Bank & Union Trust Co., index based on the following components: Industrial production, freight carloadings, bank debits, department store sales (weighted 4, 3, 2, 1, respectively and adjusted seasonally).

3) Security-First National Bank of Los Angeles index, based on the following components and weights, and adjusted seasonally: department store sales, 15; building permits, 5; Los Angeles bank debits, 20; residential city bank debits 5; agricultural city bank debits, 5; industrial employment, 20; industrial power sales, 13; railroad freight volume, 6; telephones in use, 7; real estate activity, 4.

4) Index compiled by Bureau of Business Research, University of Washington. Basis of compilation not indicated.

pPreliminary estimate.

FREIGHT

Cars of revenue freight, railroad carriers in 11 Western states.

(Compiled from Assn. of Am. R.R. weekly reports)

	Carloadings		Received from Eastern Connections	
	1947	1948	1947	1948
October	701,972	531,796	382,413	297,854
*November	601,949	559,768	324,783	325,125
December	376,697	327,037	219,485	202,400
	1948	1949	1948	1949
January	515,433	423,684	272,131	242,340
February	593,982	526,425	327,746	328,279
March	455,468	451,267	269,437	264,223

*5-week period.

TRUCK TRAFFIC

(Number of commercial trucks entering state through border checking stations)

	—CALIFORNIA—		—ARIZONA—	
	1948	1949	1948	1949
January	12,666	12,510	....	....
February	11,924	11,863	....	....
March	13,380	14,377	4,741	4,845
April	13,776	14,755	4,748	4,795

BANK LOANS

Industrial, commercial and agricultural (In millions of dollars)

From weekly reporting member banks of Fed. Res. System in 7 western cities: L.A., S.F., Portland, Seattle, Tacoma, Spokane, and Salt Lake.

(Average of Wednesday reports)

1948	
October	2,184
November	2,252
December	2,297
1949	
January	2,265
February	2,191
March	2,148

*Includes 3 days of preceding month.

BANK DEPOSITS

(In millions of dollars—adjusted)

Daily average month, all member banks in 12th Federal Res. Dist. Demand deposits excluding U. S. Gov't deposits, cash items in process of collection, and interbank deposits.

	Net Demand Deposits	Time Deposits
1948		
October	8,937	6,012
November	8,930	6,014
December	8,998	6,008
1949		
January	8,959	6,086
February	8,218	6,031
March	8,760	6,124

MANUFACTURING EMPLOYMENT

Estimated Number of Employees—Sources: U. S. Bureau of Labor Statistics and State Agencies

	WASHINGTON		OREGON		CALIFORNIA		TOTAL PACIFIC	
	1948	1949	1948	1949	1948	1949	1948	1949
December	172,900	163,500	.....	109,700	705,000	702,800	.....	976,000
January	167,200	163,400	125,500	104,400	703,500	693,700	996,200	961,500
February	184,600	169,000	128,200	112,900	700,400	690,300	1,013,200	972,200
March								

	MONTANA		IDAHO		WYOMING		COLORADO		NEW MEXICO		ARIZONA		UTAH		NEVADA		TOTAL MTN.	
	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949
January	17,700	....	18,200	19,000	6,000	6,600	57,200	.....	8,400	9,500	14,700	14,300	25,100	26,500	3,300	3,200	150,600	53,500
February		16,600	17,700	17,600	6,000	.....	.....	.....	8,200	9,500	14,600	14,800	24,119	25,500	3,400*	3,100	.....	.....
March	.....	.....	17,000	18,100	....	....	.....	.....	8,200	9,600	14,700	15,200	24,402	26,000	3,400*	3,100	.....	.....

*Revised.

WHOLESALERS' SALES

In thousands of dollars. Percentage changes are from corresponding month of preceding year. From Bureau of the Census.

MOUNTAIN

	Automotive Supplies	Change	Electrical Goods	Change	Furn. and house furn.	Change	Groc. and foods exc. farm prod.	Change	General Hardware	Change
Sept.	727	+12	4,266	+ 29	...	....	....	....	....	....
October	1,098	— 1	3,633	+ 10	471	+ 1	....	....	2,483	— 5
November	842	+ 3	4,339	+ 29	477	+13	....	....	....	....
December	318	1	3,573	+ 10	300	—15	....	....	1,766	+ 6
August	752	+10	3,583	+ 36	242	—10	....	....	....	....
January	575	— 3	2,492	— 11	365	—10	....	....	1,326	+ 5
February	776	— 3	2,791	— 4	...	....	....	....	....	....

PACIFIC

											Industrial Supplies	Change	Lumber & bldg. mat.	Change	Mch. equip. and supplies excl. elec.	Change		
Sept.	2,148	— 4	17,422	+ 27	315	+ 5	4,567	....	7,439	+ 4	2,080	+28	1,470	+10	...	....	...	....
October	2,879	—11	14,094	+ 13	1,926	— 3	6,174	....	6,995	— 3	2,252	+ 7	1,403	— 6	442	—22	...	....
Nov.	2,644	— 9	12,860	+ 13	336	+ 2	9,487	....	5,664	— 9	2,138	+25	....	....	517	— 8	...	....
Dec.	1,705	— 5	11,662	— 12	366	— 2	4,364	....	3,898	— 3	360	— 5	....	....	415	—29	...	....
Jan.	2,061	—14	9,737	— 10	1,188	— 32	4,308	....	4,774	—14	1,508	—20	....	....	...	....		
Feb.	1,383	—20	11,385	— 11	271	— 33	3,988	....	5,172	—21	1,876	— 2	923	—37	...	....		

*Full-line wholesalers.

CONSUMERS' PRICE INDEX

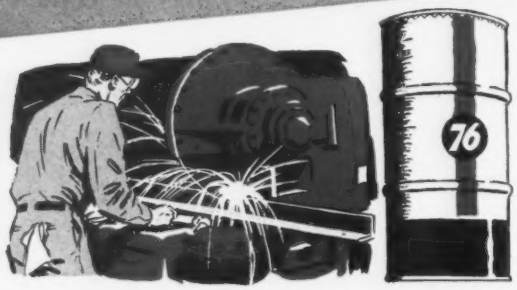
From Bureau of Labor Statistics

100 = 5 yr. Avg. 1935-39

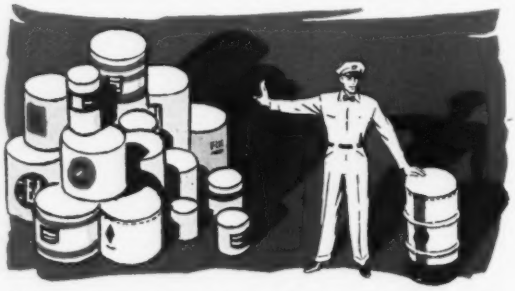
	Los Angeles	San Francisco	Portland	Seattle	Denver
Sept. 15	171.0	177.1	....	....	....
Oct. 15	171.8	....	180.1	....	171.0
Dec. 15	172.7	176.7	....	....	....
Jan. 15	172.7	....	178.8	....	171.0
Feb. 15	171.3	....	....	174.3	....
Mar. 15	171.0	174.6	....	....	....

SAVE TIME— CUT COSTS with MULTI-PURPOSE UNOBA GREASE!

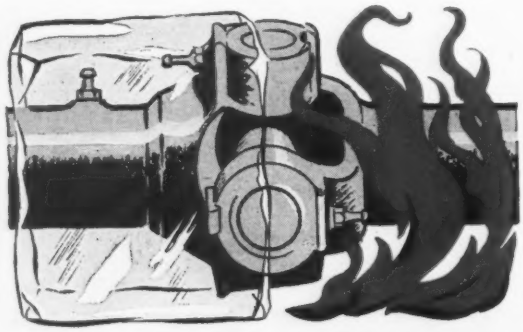
1. Prior to Union Oil Company's development of multi-purpose UNOBA, practically the only greases available were made with sodium, calcium and aluminum bases. Calcium base grease is water-resistant but has a low melting point. Sodium base resists heat but doesn't stay put in the presence of moisture. Aluminum base withstands water but jells at high temperatures.



2. There was an obvious need for an all-around grease that would resist *both* heat and water. Union Oil Company's development of UNOBA—a *barium* base grease—filled this need for the first time in history. As a result, multi-purpose UNOBA is in demand for a great number of uses in all branches of industry.



3. For example, trucks and automobiles formerly required a half-dozen or more lubricants for a single lube job. Now these specialized greases are replaced by UNOBA—one grease for the entire job. Industrial plants find that UNOBA simplifies lubrication by performing jobs formerly requiring many different types, grades and brands of greases.



4. UNOBA gives thorough protection at temperatures from below freezing to 300° F. It sticks to metal surfaces with a tenacity that boiling water can't break. Because of these qualities, industry has found multi-purpose UNOBA to be the ideal lubricant. For UNOBA saves time and cuts costs by simplifying lubrication and gives the greatest possible protection in the presence of extreme heat or heavy moisture.

For full information phone your local Union Oil Representative or write Sales Department, Union Oil Company, 617 W. Seventh St., Los Angeles 14, Calif.

ANOTHER

UNION OIL

SUCCESS-TESTED

PRODUCT

INDEX OF DEPARTMENT STORE SALES

Index numbers, 1935-39 daily average=100 with seasonal adjustment. Compiled by Federal Reserve Bank.

	Total 12th Fed. Res. Dist.		Southern California		Northern California		Portland		Western Washington		Eastern Washington and northern Idaho		Utah and southern Idaho		Phoenix	
September	347*	355	392	404	299	324	322	341	1947	1948	1947	1945	1947	1948	1947	1948
October	342*	336	379*	374	293	297	341	346	359	309	363	362	337*	329	459	473
November	347	323	383	341	303	291	341	328	364	307	362*	369	343	330	457	467
December	363*	368	403*	404	322	338	350	355	354	336	375	366	360	326	488	452
*Revised									366	373	382	383	358	342	493*	496
	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949
January	347*	334	385	376	295	302	354	326	351	327	374	345	377*	305	457	412
February	326*	295	375*	332	286	275	303	279	312	286	317	292	318*	260	441	402

*Revised

INDEX NUMBERS OF WHOLESALE PRICES BY GROUPS OF COMMODITIES AND BY MONTHS

Bureau of Labor Statistics, Washington 25, D.C.
(1926 = 100)

Year and Month	Farm Products	Foods	Hides and Leather Products	Textile Products	Fuel and Lighting	Metals and Metal Products	Building Materials	Chemicals and Allied Products	House Furnishing Goods	Miscellaneous	ALL COMMODITIES
1948 Yr. Avg.											
October	182.2	177.3	185.5	146.8	137.2	172.4	203.3	134.4	147.4	119.0	165.0
November	180.8	174.3	186.2	146.1	137.3	173.3	202.9	133.2	148.2	119.2	163.9
December	177.3	170.2	185.3	145.3	137.0	173.8	202.0	130.5	148.4	118.5	162.2
1949											
January	172.5	165.8	184.8	146.0	137.0	175.9	202.2	125.7	148.2	117.3	160.6
February	168.3	161.5	182.3	145.2	135.9	175.5	201.4	122.3	148.4	115.3	158.1
March	171.3	162.9	180.4	143.7	134.4	174.4	200.9	121.1	148.1	115.7	158..0

Oil

Two successive price cuts since December, totalling 45 cents per barrel, have drastically shaved the profit margin of West Coast refiners —threatening, in fact, to wipe out the small refiners' margin completely.

Complicating the outlook is the fact that production is out of balance—too much of the heavy petroleum products, too little of light ones.

Soaring auto production forecasts a record demand for gasoline this summer—but to produce this gasoline means increased output also of its twin product, the heavy fuel and residual oils.

The industry is trying hard to restore the balance. Faced with a declining market, major producers have pinched down their output of heavy crudes of 2,500 barrels a day, preferring to leave them underground rather than to convert them into products that must be stored above ground until sold.

A growing factor in the situation is the continued conversion of railroads from steam to diesel power. In the East, a coal strike might mean increased switching from coal to petroleum fuels, but the West probably would not be greatly benefitted.

Union Oil officials say new engineering developments make it possible for their company to step up production of gasoline, diesel fuel, and other light products by 50% from available crude, reducing output of heavy fuel oils correspondingly. To put these changes into effect, however, would mean refinery changes that would take three or four years, at a cost yet undetermined.

Meanwhile, industrial fuel oil now is priced lower than crude oil from which it is made, leaving a differential which must be absorbed through higher costs of other petroleum products.

Canadian production continues to soar. Refineries there have been receiving 16% more crude oils per day than a year ago, while imports from the U. S. have dropped about the same percentage. Alberta's oil reserves, trifling two years ago, today are estimated at a million barrels, or nearly a third as great as California's total proved reserves.

Shell Oil has set aside $33,000,000 to be spent this year for expansion of all phases of its operations in the West, from exploring for new oil fields to improvement of its refining and marketing facilities. Reason: Increased population, bigger market here.

PETROLEUM

(California, Oregon, Washington, Arizona, Nevada)
(From Bureau of Mines)

	CRUDE PRODUCTION (Barrels, daily avg.)	TOTAL DELIVERIES (Thousands of barrels daily)							
		GASOLINE		GAS OIL & DIESEL		HEAVY FUEL OIL		ALL PRODUCTS	
	1948								
September	766,000	370	359	113	100	386	248	1,030	822
October	938,000	356	332	139	108	375	295	1,010	850
November	953,000	317	351	138	140	380	320	978	942
December	950,000	349	358	173	185	441	387	1,091	1,072
	1949	1948	1949	1948	1949	1948	1949	1948	1948
January	941,000	356	369	143	172	392	426*	1,016	1,026
February	947,000	360	365	...	171	398	391	1,025	1,059

Electric Energy

Taking the West as a whole, supply of electric energy in the spring months has exceeded demand by a fair margin and the rate of increase in demand has begun to flatten out, although there is no actual slackening of demand. As stream flows have increased, steam generation requirements have been at a lower level, required only for short period peaking purposes. In California the demand upon the major utilities has been less than last year, which may be attributed in large measure to the fact that heavy pumping for irrigation was necessary in the early months of 1948.

Water supply at Coulee Dam in Washington was 20 per cent greater in April this year than last, and water has been drawn off from Hoover Dam to make space for the late spring run-off. Arizona water conditions are reported considerably better than for several years, although still below normal. In the Salt River valley around Phoenix, much of the power shortage has been due to the fact that the electric system there still operates on 25 cycles.

ELECTRIC ENERGY

(Production for Public Use—In thousands of kilowatt hours. Source: Federal Power Commission)

	Mountain		Pacific Northwest		California		Total Pacific	
	1947	1948	1947	1948	1947	1948	1947	1948
September	1,277,108	1,473,455	1,428,510	1,699,765	1,761,157	1,859,470	3,189,667	3,559,235
October	1,260,471	1,376,602	1,575,071	1,803,868	1,726,821	1,817,105	3,301,892	3,629,973
November	1,260,982	1,418,988	1,595,287	1,791,107	1,602,374	1,752,738	3,197,661	3,543,845
December	1,400,439	1,488,417	1,717,793	1,939,865	1,693,604	1,887,966	3,411,397	3,827,831
	1948	1949	1948	1949	1948	1949	1948	1949
January	1,426,511	1,524,171	1,749,203	1,913,279	1,683,736	1,893,025	3,432,939	3,806,304
February	1,363,093	1,423,744	1,648,682	1,721,271	1,590,049	1,610,229	3,238,731	3,331,500

*Revised.

NATURAL GAS

1948 Production—Millions of cubic feet

California	578,994
Colorado	12,412
Montana	40,690
New Mexico	179,171
Texas	2,710,422
Utah	6,872
Wyoming	49,178

Coal

Intermountain bituminous coal production is holding to normal or above for this season of the year. The season decline, escaped during the past few years because of export business, will likely be felt this summer as the export trade has vanished.

BITUMINOUS COAL AND LIGNITE

(In thousands of tons—From Bureau of Mines)

	Colo.-N. Mex.		Wyoming		Utah	
	1948	1949	1948	1949	1948	1949
January	869	743	629	566	781	666
February	781	755	638	520	671	645
			Montana		Wash.-Alaska	
			1948	1949	1948	1949
January			270	264	167	141
February			253	270	162	122

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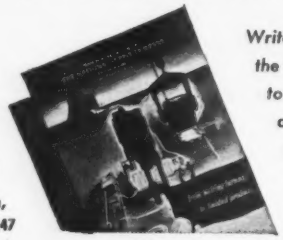

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THE NATIONAL SUPPLY COMPANY — IDEAL ELECTRIC STEEL — QUALITY FIRST

Steel

Although the market has been steadily softening, except for plates and some grades of sheets, with adequate supply of practically everything but these two classes of steel, some of the mills on the Coast feel that much of this situation has been due to users working off their inventories, and that some increase in demand is noticeable. Bethlehem cut its rolling mill operations at South San Francisco to a four-day week in May, but the output is still higher than 'n wartime. Bethlehem's April production at South San Francisco, Seattle and Los Angeles reached an all-time high of 62,599 net tons of steel ingots, an increase of 6% over March and equivalent to an annual production of 750,00 tons. Fontana is now drawing all its ore from the Eagle Mountain mine, plus a certain amount from Utah for technical needs, and the Vulcan mine, the original ore source for Fontana, has been closed down. The Kaiser-Frazer blast furnace at Provo has been shut down.

Freight absorption is now becoming popular, with Kaiser leading the way with an announced schedule covering structural shapes, carbon and alloy bars, hot and cold rolled strip and hot rolled sheet centering principally around the highly competitive San Francisco Bay area. Others are also reported to be absorbing freight where necessary to meet competition, although some are still sticking to f.o.b. mill pricing.

More Eastern independents are returning to the Coast market on items which they can compete.

Although large amounts of Japanese scrap already have been imported, the supply of domestic scrap has increased so greatly and the price fallen so much that it is questionable how much more will be purchased from Japan.

IRON AND STEEL
Western Area of the United States
From American Iron and Steel Institute (in net tons)

	Pigiron Output	Percent of Capacity	Steel Output	Percent of Capacity
October	188,238	85.0	413,721	96.3
November	209,571	97.8	428,986	103.1
December	216,958	98.2	425,969	99.4
January	232,437	93.9	436,216	97.6
February	209,082	93.6	402,533	99.7
March	235,176	95.0	451,926	101.1

Alloy Steel

	Output	Carbon Ingots, Not Topped*
September	3,553	6,119
October	6,879	10,916
November	4,995	13,593
December	5,357	10,242
January	7,706	9,096
February	5,945	13,769
March	8,127	13,896

*Included in total steel.

Nonferrous Metals

Nonferrous metal production is continuing at a high level. Sharp price declines in lead and zinc may adversely affect production later on by discouraging development work. But reactions thus far are strictly vocal.

Zinc plant capacity in the Northwest states of Montana and Idaho has increased 32 per cent over 1940, according to a report of Howard I. Young, president of American Zinc, Lead and Smelting Company. In 1940 it was 204,000 tons of prime slab zinc, but in 1949 had reached 270,000 tons.

(Production in short tons. From U. S. Bureau of Mines)

	ARIZONA		UTAH		MONTANA		NEW MEXICO		NEVADA		WEST'N STATES	
	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949
Copper	29,300	32,200	21,980	7,680	4,900	5,350	5,652	4,979	3,000	2,850	65,547	53 884
Lead	.....	2,550	.....	3,500	....	1,550	....	522	....	780	.....	19,720
Zinc	.....	5,100	.....	2,825	....	5,515	. ..	3,504	....	2,100	.....	30,689

Lumber

Lumber production has fallen well behind output for 1948. According to H. V. Simpson, executive vice president, West Coast Lumbermen's Association. The one bright spot in the lumber picture nationally "has been the increasing demand by consumers for utility and economy grades of Douglas fir lumber which is aiding West Coast mills in their forest conservation drive," he said.

Western pine production in early May, however, was running close to 1948, although orders were not as high as a year ago.

(In thousands of board feet)

From West Coast Lumbermen's Association (Douglas Fir, Sitka Spruce, Port Orford Cedar, West Coast Hemlock, Western Red Cedar):

Year through March	1947	1948	1949
Production	2,395,397	2,356,813	2,079,985

From Western Pine Association figures (Idaho White Pine, Ponderosa, Sugar Pine and associated species):

Year through March	1948	1949
Production	665,933	514,540

From California Redwood Ass'n figures (includes redwoods and whitewoods):

Year through March	1949
Production	116,713

Aircraft

Pursuing its recent shift in strategy, the Air Force has ordered 39 more B-36 superbombers, bringing the total of those on hand or under construction to 169. The $172,000,000 needed was taken from money released by cancellation of orders for Flying Wings and other aircraft.

One effect of that cancellation has been to reduce Boeing's backlog nearly $100,000,000 from its former figure of $445,000,000, with losses in engineering and development costs and termination charges on the 42 B-54's cancelled running as high as $40,000,000. Northrop and North American sustained their major cutback a month earlier. The shifts reflect a new bombing technique working out for the ultra-long-range B-36 bomber in combination with atomic bombs.

There is some talk that the B-36's may be fitted out with four additional jet engines to supplement their six cylinder-type motors, giving them a huge spurt of additional power in an emergency.

Consolidated Vultee is flourishing under all this business. Even its Forth Worth, Texas, plant has enough work on hand to keep in production through 1950.

Douglas has Navy orders scheduled for its El Segundo plant well into 1952. Its Long Beach plant is working on an order for 128 of the new C124-A transports. The parent plant at Santa Monica has no military aircraft orders, although it is hoping to sell the AAF the DC-6A, a clamshell-nosed cargo version of the DC-6.

Northrop is working on a $65,000,000 backlog which includes a new contract for F-89 all-weather fighters, conversion of several Flying Wing bombers from propellor to jet power, and other experimental work.

North American has entered into a licensing agreement whereby its speedy F-86 Sabre, a single-seat fighter with swept-back wings and tail, will be manufactured in Canada for the Royal Canadian Air Force. It is powered by a GE jet engine.

Cancellation of the Navy's huge carrier is worrying aircraft makers somewhat because the expectation was that there would be need for planes able to take off from a carrier deck with a two-ton load of bombs.

The Air Force has begun conversion of its jet aircraft to use a low-octane gasoline instead of kerosene for the reason that although the new fuel costs the same, about twice as much of it can be obtained from a barrel of crude oil. Necessary modifications in the airplane are slight.

Plywood

Despite falling plywood prices, April sales were well ahead of a year ago and in the last week of the month exceeded 39,000,000 square feet, nearly 50 per cent above the same week of last year, according to E. W. Daniels, chairman of Harbor Plywood Corporation. Labor and logs have not declined in cost, however, despite plywood price declines of 25 per cent.

Examples of price declines quoted by him: Chicago suburbs: plywood for interior walls of homes, 16½c last July, sold last week in April 13c a foot. Savannah, Georgia: plywood dropped from 19 to 16c a foot. At Washington, D. C., a popular grade of fir plywood for inside paneling, last fall 15c a foot, over-the-counter at lumber dealers for 12½c. At Dallas, a popular plywood item down from 18½c to 12c a foot. Outdoor type plywood used for the siding of homes, last summer 21½c in the Chicago area, down to 17½c a foot. Prices at Washington, D. C., down to 19c from 24c for a popular plywood thickness and grade.

PULPWOOD
(Pacific Northwest)
(Cords of 128 cu. ft., roughwood basis, Source: Bureau of Census)

	Receipts	Consumption
September	415,948	276,059
October	402,835	294,824
November	266,617	270,353
December	266,617	270 353
January	199,406	278,747
February	31,976	260,689

Building Materials

Along with other products, the market has become more competitive. Interior tile and smaller sizes of sewer pipe are being quoted for immediate delivery, but there is no slackening of demand. Curtailments in the steel industry are likely to affect refractories in the coming months.

STRUCTURAL CLAY PRODUCTS

	UNGLAZED BRICK (in thousands of standard brick)		UNGLAZED STRUCTURAL TILE (short tons)		VITRIFIED CLAY SEWER PIPE (short tons)	
	Mountain	Pacific	Mountain	Pacific	Mountain	Paciffe
Sept.	16,668	23,813	3,892	2,278	2,367	15,340
October	15,964	31,230	2,780	2,662	2,537	15,642
November	12,202	23,662	3,059	3,025	2,181	15,233
December	10,854	19,003	3,311	2,652	2,569	14,050
January	6,864	12,192	2,200	1,494	2,321	13,630
February	7,877	11,163	1,562	1,468	2,280	12,967

Cement

Production was considerably off in the first quarter, both in California and western Washington, but conditions were a little tighter in Oregon.

(In thousands of bbls.; from U. S. Bureau of Mines)

	—California—		Oregon - Wash.		Colo.-Wyom. Mont. Utah - Idaho	
	1947	1948	1947	1948	1947	1948
Sept.	1,931	2,152	585	676	435	486
Oct.	1,964	2,320	589	639	431	591
Nov.	1,969	2,078	462	591	418	610
Dec.	2,015*	1,890	517	500	387	507

*Revised.

	1948	1949	1948	1949	1948	1949
Jan.	1,936	1,653	422	354	408	351
Feb.	1,824	1,593	414	208	315	279

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Apparel

A somewhat brighter tone pervades the apparel industry. Sales have picked up a little and the Easter season was excellent. Enthusiasm is kept well in check, however, by a rather spectacular softening in fabric prices.

Manufacturers who are quoted successively lower prices on raw materials, naturally begin to wonder what the effect will be on their present inventories. Buying tends still more toward a hand-to-mouth basis, with purchases concentrated on items which will be resold in very short order.

Many manufacturers are enjoying better business this year as result of lessons learned from hard knocks in last year's markets. Since it was commonly agreed that the public was insisting on lower-priced goods, some firms had swung into production of cut-price, cut-quality items whose sale has been extremely disappointing. The buying public, apparently, is spending its money carefully and is determined to get full value, even if it has to pay higher prices in order to get merchandise that will wear and look better longer.

Those manufacturers that have narrowed their lines to elminate extravaganza and catch-penny sellers are finding the market reasonably encouraging. Others are complaining about hard times.

Recognizing the westward march of cotton production—with California and Arizona figuring among the top states in output volume, and with cotton quality topped only by choice Egyptian varieties—the National Cotton Congress recently held its first meeting in the West. Coordinated with it was a fashion show sponsored by the California Apparel Creators, illustrating the extent of the West's production of cotton-fabric clothing. Exhibits ranged from workingman denims to soft cotton taffeta dresses and from children's wear to sports wear and formals.

The 1,000 delegates launched a $1,000,000 national campaign for promotion of cotton apparel. Simultaneously the Cotton Congress blasted the 75-cent-an-hour minimum wage proposal, which it said would make cotton cost the farmer 51c a pound, a figure never reached by U. S. markets.

APPAREL

(In thousands of dollars)

Total Women's, Misses' & Juniors' Outerwear

	Los Angeles	San Francisco
1947		
July, August, September	23,245	6,699
Oct., Nov., Dec.	24,948	6,844
1948		
Jan., Feb., March	30,173	7,897
Apr., May, June	19,052	4,521
July, Aug., Sept.	26,502	7,603

	Men's Overalls (thousands of dozens) California	Men's Wool Work & Dress Trousers (thousands of units) California
March	33.0	109.6
April	29.0	92.6
May	27.7	86.3
June	30.4	76.1
July	26.2	66.5
August	30.5	95.1

COTTON

(U. S. Census Bureau)

Running Bales Ginned

	1946	1947	1948
California	407,118	756,111	892,683
Arizona	139,896	215,384	305,011
New Mexico	131,097	164,347	223,310

COTTONSEED PRODUCTS

(U. S. Census Bureau)

Tons Crushed, Aug. 1 - Dec. 31

	1947-48	1948-49
California	90,436	109,407
Arizona	36,473	41,619

Sugar

Sugar beet plantings will be considerably down from last year, according to the March 1 forecast of the U. S. Dept. of Agriculture, although since that date the California situation has improved due to less favorable prospects for other crops which have caused some farmers to turn back to beets. The forecast, in acres is as follows:

	1949	1948
California	148,000	187,000
Colorado	145,000	123,000
Idaho	64,000	92,000
Utah	30,000	40,000
Montana	60,000	66,000
Nebraska	50,000	50,000
Utah	30,000	40,000

Final harvest figures for 1948, reported by the Sugar Beet Association, which include the spring crop in the Imperial Valley of California, are as follows, in bags; with comparisons for 1947:

	1948	1947
California	7,699,781	8,215,000
Washington	698,761	984,393
Oregon	1,495,701	1,644,437
Utah	1,166,619	2,109,443
Idaho	2,927,790	4,567,566
Montana	1,879,766	2,524,421
Wyoming	765,672	1,324,408
Colorado	4,119,773	7,575,511
Nebraska	1,114,959	2,069,013

Canning & Packing

The 1949 canning season is close at hand, with some big crops in prospect and canners still holding big inventories of fruits, tomatoes and tomato products. This means that growers will have to take less for their crops this year, and speculative packing probably will be on a much smaller scale than was in vogue in prewar years because it is much easier now to visualize all the factors involved. Apricot growers expect a 190,000-ton crop and a marketing agreement to limit output is under consideration.

An agreement among corn growers in the Pacific Northwest not to take less than $23 collapsed and the price fell to $20. Canners are reported offering only $22.50 a ton for tomatoes in California, against $25 last year, which has caused some growers to plant sugar beets instead. The asparagus market has been in a more or less demoralized condition. California spinach pack considerably from expectations, because early hot weather finished off the crop.

Meat

Meat packers are in the unhappy position of having to pay high prices for their livestock while selling prices of dressed meat have been falling. More and more they are turning to the idea of developing new by-products from their tallow, to offset the inroads in the tallow market made by the petroleum detergents.

ETHYL ALCOHOL

(From Bureau of Internal Revenue)

Production (in proof gallons)

DOMESTIC UNDENATURED ALCOHOL

	California	Colorado	Washington
January, 1949	559,736	.....	481,367
February, 1949	219,204	....	401,952
March, 1949	378,555	.....	448,298

DENATURED ALCOHOL

	Completely Denatured California	Specially Denatured California	Specially Denatured Utah	Specially Denatured Washington
January 1949	42,898	323,971	....	24,697
February, 1949	19,740	178,780	....	8,203
March, 1949	20,905	267,459	....	8,186

CONFECTIONERY AND COMPETITIVE CHOCOLATE PRODUCTS

(From Bureau of Census)

(In thousands of dollars)

Month	COLO. - IDAHO - UTAH Sales	COLO. - IDAHO - UTAH Per Cent Change from same month of Preceding Year	— WASH. - OREGON — Sales	— WASH. - OREGON — Per Cent Change from same month of Preceding Year	— CALIFORNIA — Sales	— CALIFORNIA — Per Cent Change of Preceding Year from same month
September	593	— 8	599	+15	2,156	+ 3
October	808	+ 3	466	—24	2,929	+ 3
November	980	— 7	580	—11	3,253	+15
December	901	— 3	453	—13	2,669	— 7
January	577	— 9	397	—18	2,333	+ 6
February	490	+ 3	296	+ 8	2,122	— 2

THE WESTERN SOFT DRINK INDUSTRY

A preliminary picture for 1947 from the Bureau of the Census

(Money figures in millions)

	Number of establishments	All employees — Number (average for the year)	All employees — Salaries and wages (total)	Production and related workers — Number (average for the year)	Production and related workers — Wages (total)	Value added by manufacture*	Cost of materials, fuels, electricity, and contract work	Value of shipments
Mountain	239	1,970	$ 5	1,134	$2	$11	$ 9	$20
Pacific	351	5,084	18	2,287	8	33	23	56
California	231	4,025	15	1,732	7	26	18	44

**For 1947, value of shipments less cost of materials, fuel, electricity, and contract work.*

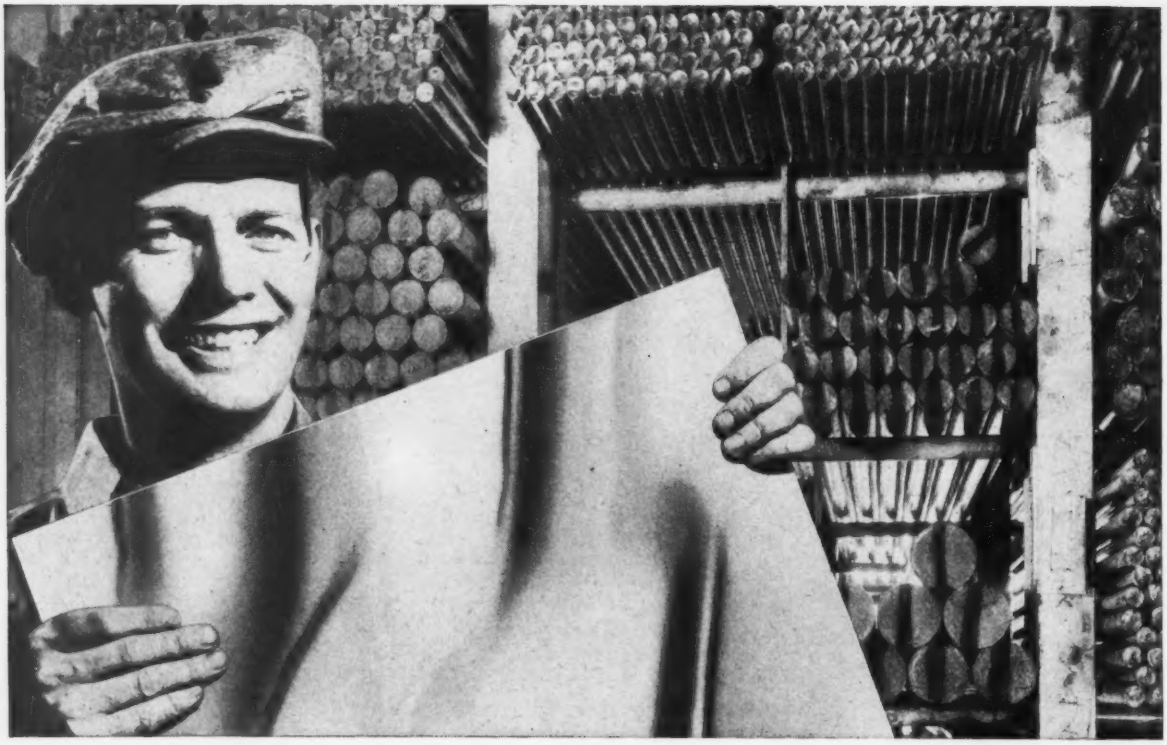
Flour

The flour market has improved considerably in recent weeks, as prospects of price declines have faded because the government loan set-up does not force the farmer to sell his grain. Consequently bakers have had to buy, and there also have been some heavy government and Army purchases on the West Coast. The mill feed situation has continued tight, although supplies from Argentina have been coming into Pacific Coast ports. Eastern Washington worried about glut of wheat storage at interior mills, elevators and warehouses, in view of huge crop expected.

WHEAT FLOUR

(In thousands of sacks; from Bureau of the Census)

September	1,475	340	324	450	331	2,920
October	1,405	332	349	496	325	2,907
November	1,550	288	314	462	329	2,943
December	1,554	285	318	445	372	2,974
January	1,539	269	313	439	375	2,935
February	1,388	236	269	366	353	2,612



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Durable Allegheny stainless steel provides dependable protection against corrosion and high heat resistance. Its versatility, gleaming beauty and *immediate availability* frequently make it the practical metal for many uses where other steels are usually specified.

Expert technical assistance in determining the kind of stainless best suited to your special needs is available at all thirteen Ryerson plants. You can rely on it because more than a quarter of a century of stainless experience stands behind the recommendations of Ryerson stainless specialists.

So draw on complete Ryerson Allegheny Stainless stocks and be assured of quick shipment, anywhere —and dependable service. Contact the nearest Ryerson plant for all your requirements.

PRINCIPAL PRODUCTS

BARS—Carbon & alloy, hot rolled & cold finished

STAINLESS—Allegheny metal plates, sheets, bars, etc.

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Sheared & U. M., Inland 4-Way Floor Plate

TUBING—Seamless & welded mechanical & boiler tubes

SHEETS—Hot & cold rolled, many types & coatings

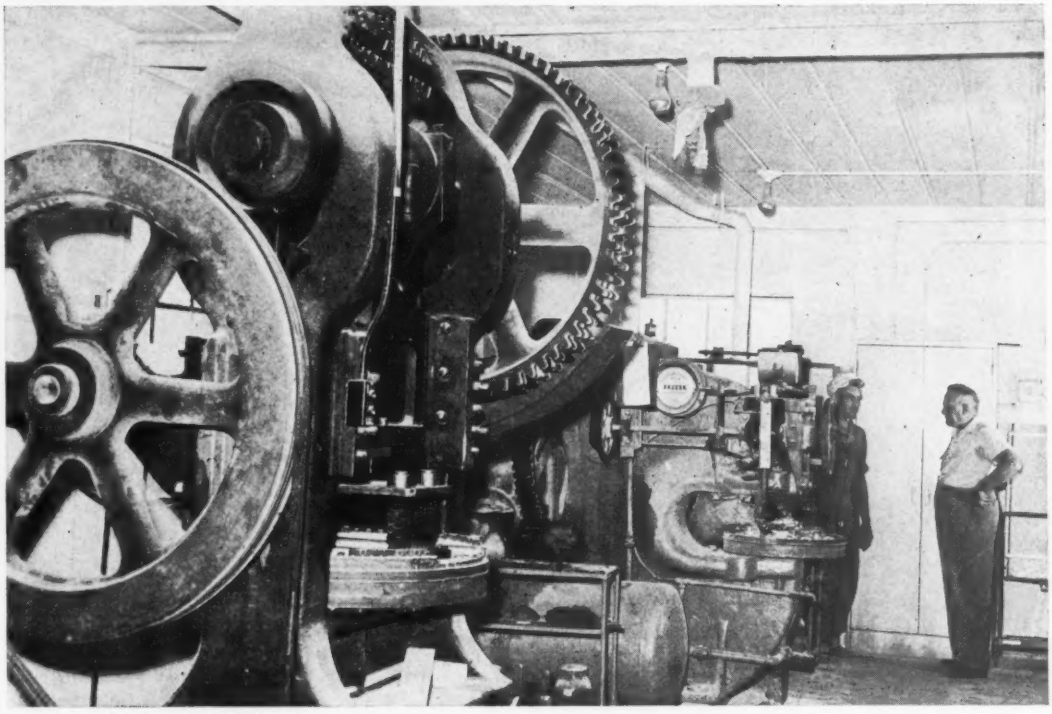
MACHINERY & TOOLS—For metal working

RYERSON CERTIFIED STEELS

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. *Los Angeles Plant:* Box 3817, Terminal Annex, Phone: Angelus 2-6141. *San Francisco Plant:* Box 188, Emeryville, Phones: OLympic 3-2933, Enterprise 10176. *Other Plants:* Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston.

THE INDUSTRIALIZED WEST



SOMETHING FROM NOTHING . . . *Making ready-to-set turquoise stones from powdered ore requires tremendous pressures and a secret cement formula. Plenty of "useless" ore was available near Bouse, Arizona. A. DeLisle had both it and an idea. Today, Phoenix Gems, Inc. uses presses like this one to exert 250 pounds pressure to the square inch, to manufacture quantities of the little gems daily for the costume and manufacturing jewelry trade. Just another instance of a good application of Western ingenuity.*

Taking the Curse Out of Seasonal Buying and Production Peaks

By GRAHAME B. RIDLEY
Plant Engineer, California Walnut Growers Association, California

OUR approach to the problems of production in processing, packaging and handling walnuts is always conditioned by seasonal considerations. The situation is complex because we have not only a seasonal limitation, but actually a top and bottom time limit which subjects us to a "double squeeze."

Because a great many industries and individual businesses are faced with some seasonal factors, it is felt that the solutions evolved by our Association, whose 9,400 members produce all but a small fraction of the walnuts consumed in this country, will be of some benefit.

Here are the two time limits under which we work:

1. The growing season for California walnuts brings them to harvest ripeness in the early fall, so that first receipts from our member plants are not until late September; sometimes nuts are not received in volume until the first week in October. This is not a controllable situation.

2. Buying habits of consumers in the U. S. concentrate almost all purchases of walnuts in the holiday period, mainly between Thanksgiving and Christmas. Inventory held on store shelves after the holidays is very likely to sell rather slowly through late spring or early summer. In order to reach the large Eastern markets for even the end of the holiday buying period, shipments must leave our plant not later than the first week in December.

For these reasons the period of production activity in our plant is compressed into approximately ten weeks. During this time our plant at Vernon receives, processes, inspects, sorts, grades, brands, and packs more than 60,000,000 lbs. of nuts. During most of the rest of the year we are on almost a stand-by basis, with only skeleton crews of our oldest employees.

• General view of one of the three units in C.W.G.A. plant devoted exclusively to packaging of in-shell walnuts in 1-lb. cellophane bags.

In step with contemporary merchandising practice, and also as a possible means of stretching out the buying period, the Association for several years past has been packaging an increasing proportion of the output in 1-lb. cellophane bags. It is hoped that replacing the familiar 100-lb. burlap sack, a fixture for so many years in the grocery stores of the nation, with sparkling, convenient, tempting packages of walnuts, will gradually induce Mrs. Housewife to buy our products more regularly through the year and so reduce the strain of the one-shot market period.

Consumers Accept

In 1941 we distributed 30,000 50-lb. cases of consumer packages, increasing this to 90,000 in 1942. The war halted this development, but in 1946 we got under way again and sold 15,000 cases. Then in 1947, 205,000 cases were dispensed, and it was felt that consumer acceptance of 1-lb. packages had been demonstrated.

At the same time it was realized that a modern, highly-mechanized, volume operation was necessary for efficient output at high figures. Design and construction of such a plant was undertaken. With basement, it comprises 3 acres adjacent to our main warehouse, and its three identical production lines have a combined capacity of 9,500 50-bag cases per day. During the 1948 operations period we turned out 500,000 cases, or 25,000,000 lbs., nearly 40% of the total year's crop handled by the Association. It is gratifying to note a measurable increase of post-holiday usage and the indications are that a flattening out of our marketing bulge is taking place.

Plant Problems

Before describing our consumer packaging plant and its method of operation, there are some further subdivisions of our particular situation which should be recorded as setting the stage for what we had to do:

1. Because of the concentrated time period, we are limited in expenditures for equipment to $600 per year per operator saved; that is the average earning of a worker during our active season. Since technological obsolescence in specialized equipment is rapid, we have set a 3-year amortization period for this type of improvement, or a total expenditure for special equipment (excluding permanent installations such as main conveyors and major improvements in plant) of $1,800 per operator saved.

2. Again because of the concentration, our working force jumps literally overnight from a handful of workers to more than 800. Since this is seasonal work, we cannot count on experienced workers returning year after year, but must rely on untrained transient workers, at least for a major portion of the jobs. And because the production must go out right now to make the market, there is no time for training.

In other words, all mechanical operations introduced must be capable of being effectively and efficiently performed by an untrained worker immediately in such a way that mistakes, ineptness, or slowness of any individual, or even a considerable proportion of the total force, would have no adverse effect on the total production.

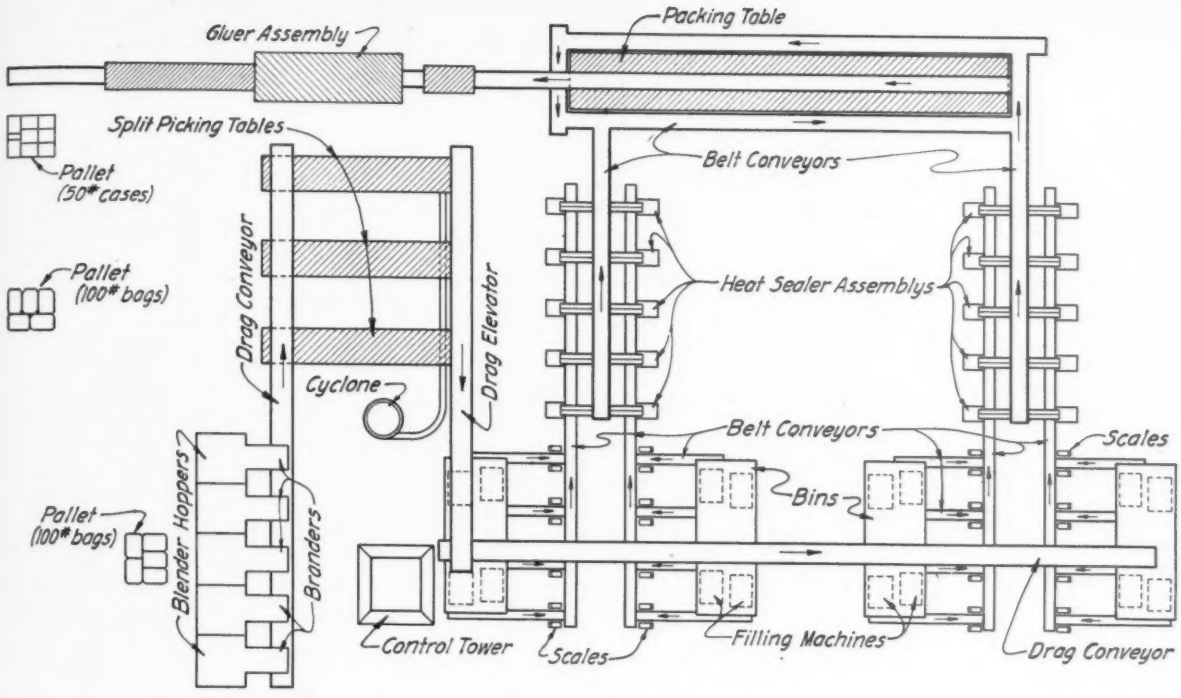
Economic Complications

3. A further complication arises because of the unique nature of our operation. Because we would be the only customer for the special equipment required, there is little inducement to establish machinery manufacturers to develop it for us. This necessitates our developing and making all but standard units ourselves.

To sum up our objectives and special problems: Caught between the double limitations of a natural harvest time and an established buying period, the Association has sought to extend the purchasing period of walnuts through use of consumer packages, making use of mass production techniques to keep packaging costs at a level that will not induce buyer resistance, but restricting capital outlay for equipment to the relatively small potential saving per worker eliminated which results from the short season.

From Bags

Walnuts are brought into the packaging plant from the main warehouse in 100-lb. bags stacked on pallets, utilizing fork trucks for this as well as other phases of materials handling. Approximately two thirds of the floor area of the packaging plant is used for storage of nuts, providing about a day's run.



• Schematic diagram, California Walnut Growers Association plant, showing location of manufacturing units in relation to each other.

First operation is blending the various lots of nuts so that, within given sizes, kernel qualities will be uniform throughout a shipment and will meet contract guarantees.

Four packs were put in the cellophane bags last season, each with its distinctive markings: first grade Large and Medium sizes branded with the Association's familiar DIAMOND stamp; and second grade Large and Long Baby sizes (not branded).

To the Blenders

Blenders, into which the nuts are dumped according to a formula worked out for each run in the inspection department, are actually arrangements of serial tumblers in which can be mixed 10-way combinations of varieties and grades.

In the course of blending, the nuts go through branders where the DIAMOND trade mark is printed on each nut. This is essentially a printing operation, using platens and stamps, and has been performed in the same manner for many years.

By Conveyors

A drag conveyor takes the branded nuts to inspection tables where splits and imperfects are removed, either by the inspectors or by dropping through the longitudinal rollers. Suction fans draw these rejects into a cyclone from which they are bagged and taken to the shelling plant where the edible kernels are recovered.

Next the nuts are lifted by drag elevator to another drag conveyor which runs along a level above the storage bins. This conveyor distributes the nuts to the bins which act as reservoirs for the filling machines.

To Filling Machines

Specially designed bag filling machines are the first example of simplification and unitization mentioned as being required by use of unskilled workers. Designed to operate at a sustained rate of 25 fillings per minute, these machines are controlled by the operator with a foot switch, so that each can regulate the rate according to her own ability. This gives her confidence so that she is rapidly able to gain the skill necessary to attain the desired rate.

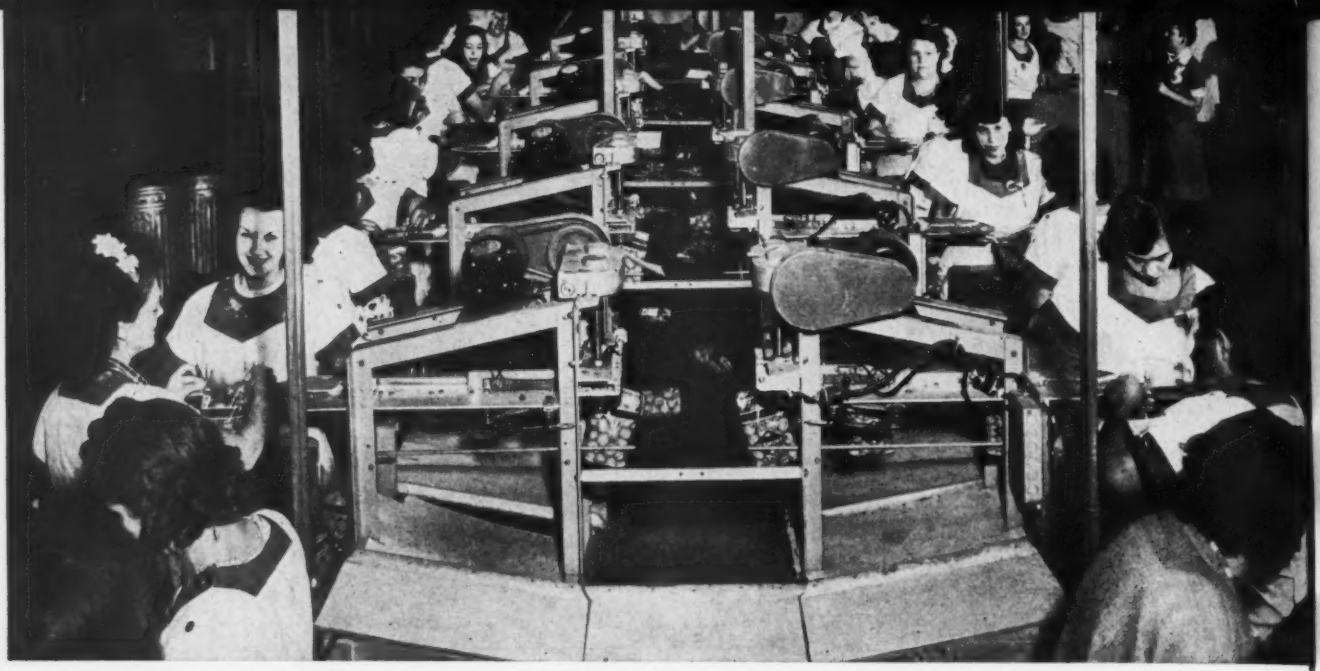
In addition, the fillers are completely automatic. The operator has nothing to do but place the cellophane bag under the spout. Nothing can be spoiled, and since the fillers are arranged in groups failure of a single one of them does not materially alter operation of the packaging unit. Fillers are constructed by adapting the branding machines, blocking off or freeing the receiving pockets in certain combinations, so that a specified number of nuts, depending on the weight-by-size ratio, is delivered to the bag. This number is stated as "one pound less two nuts."

All Automatic

Open, filled bags are then placed in upright position on conveyors which take them the short distance to the weighing stations. Here again simplification is seen. Scales are a standard over-under type, with the dial reading computed in nuts instead of in weight units. Therefore, no computation translation needs to be done by the weigher. She merely adds nuts — much easier than taking them away, which is why the fillers are set to fill under weight, so that the pointer comes to rest in a white band which is the standard packed weight of 1 lb. plus one nut. Under that standard and above it are both indicated in red.

Now the bags go directly on belt conveyors to heat sealers. Here again the operator's job is simplified so that judgment is not required. Since the size of the 1-lb. fill varies, there is a variation in the length of free material at the top of the bag for the fold. To compensate for this, jaws of the sealers are set by supervisors according to the height of the fill which is running. All the operator does, therefore, is to bring the bag up to a stop and release it into the carrier of the heat sealer, after having tucked in the side gussets.

Each sealer is constructed so that the free material is compressed in an "S" fold, making a tight bag, and also allowing the excess material, if any, to protrude at the top so that it does not interfere with sub-



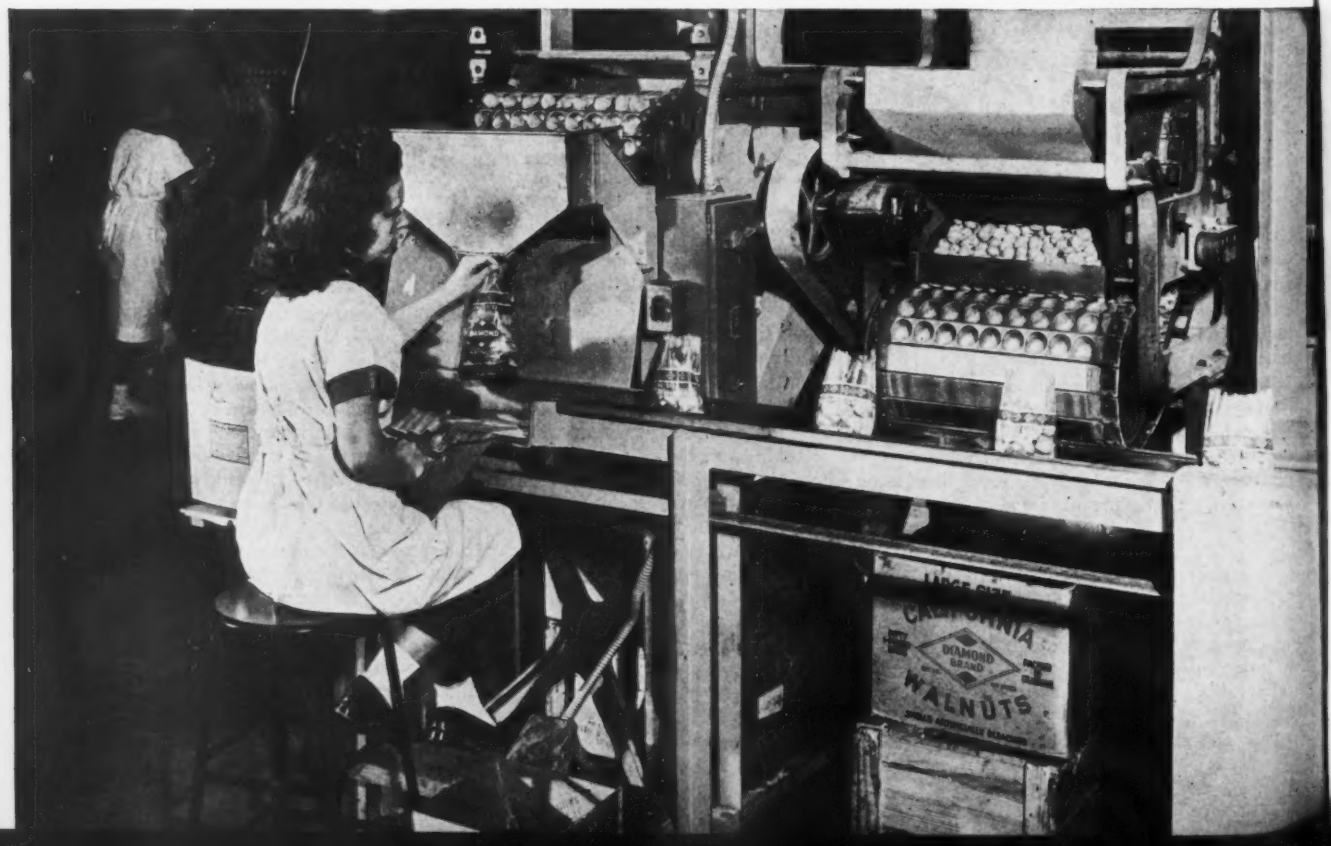
• From check-weighers, filled bags pass to sealing line. Workers take bags, tuck gussets, and insert bags into sealing machines.

sequent operations. The bags are fabricated of duplexed 300 MST cellophane, the film being coated with a heat-sealing compound. Pre-heaters begin the sealing process before the bags come into contact with the waffle surfaces of the heated pressure rolls. Released from the sealer, the bags drop onto a take away conveyor and go directly to packing tables for casing.

These tables, too, were specially designed to eliminate congestion due to inexperienced help. The principle is that of a "merry-go-round." Each table has a slider board conveyor on each side, running in opposite directions, connected by crossbelts at the ends. Under normal operation the bags are cased from the belt to which they are delivered. If missed, however, they drop to the crossbelt, go on to the next packing belt, and so on indefinitely if necessary. Of course, any surplus of unpacked bags on a table is a warning that something is wrong and is a signal to the supervisor to get things straightened out.

Packing cases are brought to the packing stations on skate wheel conveyors which run above the tables from the ends where the fiberboard cases are set up. The lower separator is inserted when the box is made up. The packer places the case on a "tipper," a pivoted stand which holds it open before her at about a 45° angle. This stand is balanced on a rocker, so that when the case is full it is given a gentle push which tips it over backwards onto a live roller conveyor for transport to the case sealer.

• Adaptations of branding machines, with some pockets blanked out, deliver an approximate pound, based on count, into the bags.



The packing scheme is two identical tiers with a pad between. Separators hold one bag in each corner, three unseparated bags on each of the four sides, and nine bags packed together in three rows of three in the center.

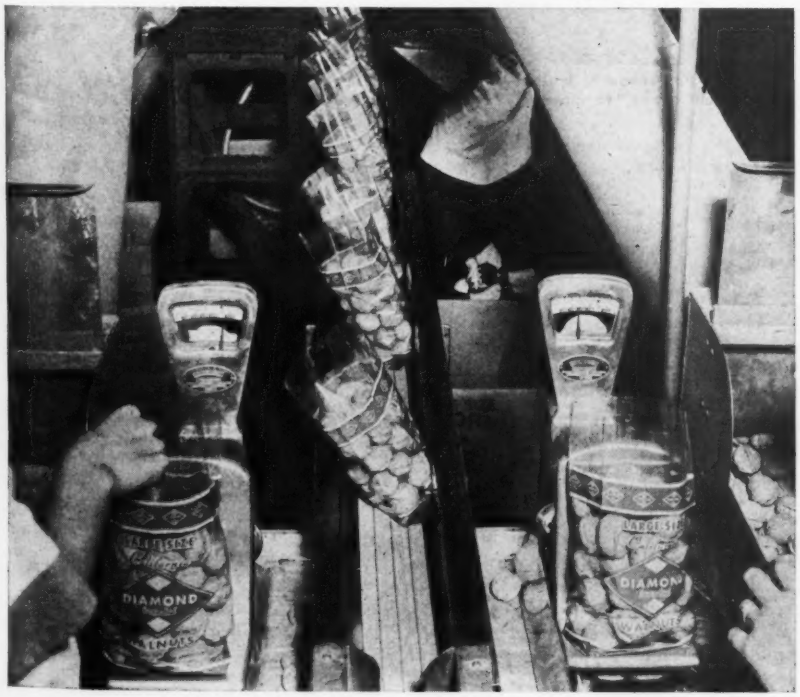
Cases are closed on standard automatic top and bottom gluers to which have been added extra long compression extensions. These have been necessitated by variation in the size-by-weight ratio of the nuts. From the gluers the cases, containing 50 1-lb. bags of nuts, are stacked on pallets for removal to the shipping area.

In general, the plan of the operation has been to get away from straight line production operations where each department or activity is a barrier across the whole flow, and where the pace of the end-output is regulated by that of the slowest operator. For this reason, we have combined the flow from each activity as soon as possible into a main stream. Thus the fillers feed into a common belt which services all the weighers, which in turn empty onto a main belt leading to the heat sealers, and so on. If a filler, for example, slows down or drops out, the only effect will be a slackening of work for the last sealer. The rest of the operations will continue at the regular pace. With four fillers and weighers for each sealer, and with conveyor belts acting as pools, the system has a good deal of flexibility for achieving the results we desired under our special conditions.

I have described one of the three identical units which make up our packaging plant. All units are controlled from a central tower which has a view of all parts of the plant. While there are emergency stop buttons here, as there are all over the plant, the principal function of this tower, in addition to furnishing a convenient lookout point, is to house mechanical timers and interlocking relays which control the conveyors and branders. It is important that these be started and stopped in proper sequence in order that uniform blends be obtained from start to finish of each lot. If this were not done, there would be portions at the beginning and end of each run that would not have the same components.

• Packaging of walnuts in one-pound consumer bags is being undertaken by C.W.G.A. in an effort to create a greater market for the product and to break down a long-established domestic custom which has heretofore confined the purchase of nuts to the holiday season.

• Close-up of check-weighing operation. Note markings on the scales, indicating the number of walnuts needed to bring bags up to full weight, or the number in excess of one pound plus one nut. Bags always have one nut more than one pound, for full measure.



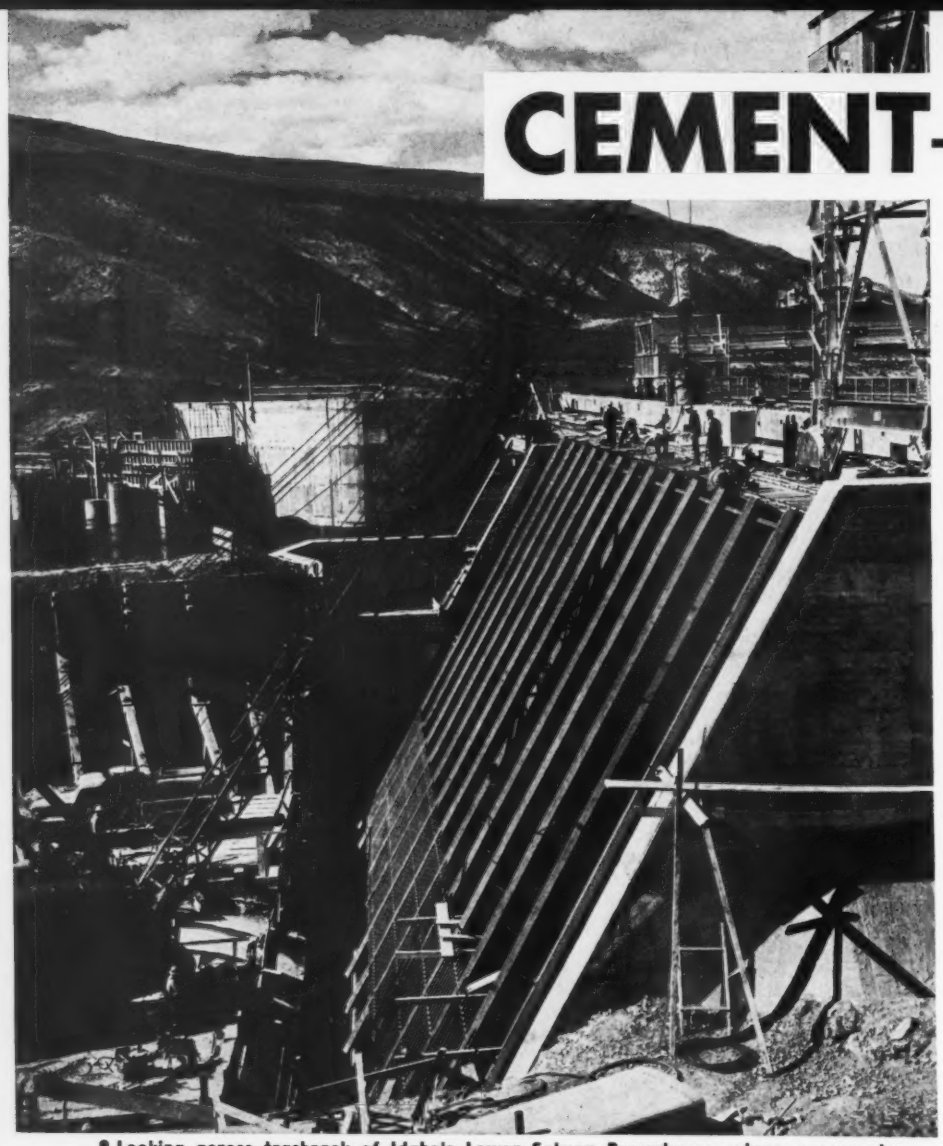
During the season the plant runs 16 hours per day, but there are stops and starts at irregular intervals, due to the varying size of the lots.

1948 season was the first in which a full three units of this packaging equipment were in operation and the Association has found its functioning satisfactory, with no major changes contemplated. Because of our spasmodic operation we are not concerned with year-in-year-out performance. If we can get something to function at top speed for three months, we have nine months to rebuild it for the next three month sprint. This is in marked contrast to mechanical requirements of continuous all-year operation.

While the cost of packaging is approximately 3½ cents per lb., and we hope to lower that as we go along, we are not displeased with the results. Even with this premium above the bulk nuts, the packages accounted for almost half of our total output, and consumer acceptance indicates this ratio will increase, with the added benefit of inducing more year 'round buying.

We don't think we have licked our seasonal problems by any means. But we do feel we've given them a pretty healthy dent, and that's something.

CEMENT---Does the Northwest Need More Plants to Make It?



• Looking across trashrack of Idaho's Lower Salmon Powerhouse, where a concrete bucket swings from the boom of a Morrison-Knudsen crane, to pour a floor slab.

POSTWAR demands upon the Portland cement industry have created critical shortages in the entire country. Increasing demand for cement by both private and public construction, coupled with a tremendous growth of regional population, have evolved a Pacific Northwest demand for cement that is greater and a supply that is shorter than the average for the country as a whole.

Such is the situation as presented by K. E. Hamblen, consulting engineer of Portland, Oregon, to the American Institute of Mining and Metallurgical Engineers, in a recent meeting at San Francisco.

He further commented that this general condition has remained critical during three postwar years, and appears to be faced for several years more. To illustrate how far off the population estimates have been, the following figures are given:

Population	Wash.	Oregon	Idaho	Total
1940	1,719,143	1,088,284	524,809	3,332,236
1948 (July 1)	2,487,000	1,626,000	530,000	4,643,000

Increase: 1,311,000—40 per cent

U. S. Bureau of the Census estimate for 1950 (Made in 1947).

Wash.	Oregon	Total
2,275,000	1,400,000	3,675,000

This was exceeded by 438,000 in these two states by July, 1948

Bonneville Power Administration estimate for 1955 (Made in 1946).

Wash.	Oregon	Idaho	Total
2,210,000	1,382,500	655,000	4,247,500

Thus the actual population, 1948, exceeds this estimate made for 1955 by 385,000.

Cement industry cannot build small mills willy-nilly as do some other kinds of industries. To get more production there are two obvious alternatives: increase present plant capacity or build new plants in new locations. Each of these necessitates most cautious and serious planning, even though an assured market can be foreseen.

Most cement companies consider a 50-year supply minimum. A proved tonnage of about 15,000,000 tons of limestone would be needed to satisfy conservative business procedure.

The case for...

Without consideration of economic factors involved, there is sufficient limestone in the Pacific Northwest to meet Portland cement demands for any foreseeable future.

Four types of cement in most general use are:

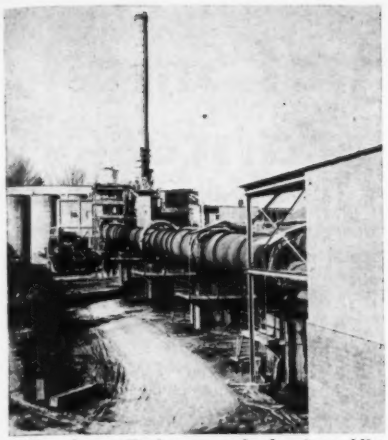
(1) Used in most general concrete construction where special properties of other types are not required;

(2) Used where moderate heat of hydration is specified, and is more resistant to sulfate reaction;

(3) Used where heat of hydration is not an important factor and where high early strength is required:

(4) Used in massive concrete construction where low heat of hydration is necessary and early strength not a prime factor.

Most Western dam construction requires type 4 or type 2. Type 4 requires chemical control within narrow limits and is a chemist's headache at most plants.



• View from discharge end of rotary kiln. Draft fan and plenum chamber on Cottrell dust collector visible at upper end of kiln. Oregon Portland Cement Co. Oswego plant.

At present there are ten plants in Oregon, Washington, and Idaho, which have a combined annual capacity of about 7,500,000 barrels. About 70 per cent of Pacific Northwest cement capacity is in Washington, and of this, 75 per cent is in Puget Sound region. Cement prices at the mill average about 12 per cent higher than in California.

Within the past 25 years, cost of a cement plant has risen to more than $6 per barrel of annual capacity. As all the plants in the region have been operating about that long, or longer, a new plant would have a minimum fixed cost in excess of 20 cents per barrel over those now operating, with interest on capital at 5 per cent. As the cement business is one of "penny profits," this would appear to be a major deterring factor in the building of new plants. It is not as gloomy, however, as it may appear. Existing plants need constant maintenance and replacement. These costs are at a level or higher than new plant construction, and some cost saving can be made with present plant design and improved operating procedures.

In addition to major federal projects which will require some 2,000,000 annual barrels of cement until completed, reference is made to the recommended comprehensive plan for the Columbia River basin (power, flood control, irrigation, and other improvements). Total estimated cost is $3,030,475,700. Though there is reason to doubt that this program will be approved in its entirety it is probable that much of it will be constructed by reason of necessity.

It is doubtful if cement production can maintain an average greater than 75 per cent of capacity over a long period of time even under "forced draft." Thus it is indicated that capacity should be increased to nearly 11,000,000 barrels per year to meet this need.

If the present population growth continues as indicated, normal cement demand should catch up with this production figure by the time the federal projects are completed.

The case against . . .

This article is the product of reliable authority in the Western cement business. It is advanced solely to point out presently existing conditions in the Pacific Northwest which could have been inadvertently overlooked by Mr. Hamblen.

Pacific Northwest region has eleven cement manufacturing plants. They are: Trident, in Montana; Gold Hill, Oswego, and Lime, in Oregon; Olympic, Concrete, Diamond, Grotto, and Metalline Falls and Spokane, in Washington; and Inkom, in Idaho. Recently the plant located near Metalline Falls, Washington. doubled its capacity, which boosts the Spokane area capacity (two plants) to 1,850,000 barrels per year.

Capacity of all these plants amounts to a yearly total of 10,150,000 barrels, but discounting the Trident plant in Montana (because of overland distance), the remaining ten plants will produce a combined capacity of 8,800,000 barrels per year.

Figuring on an average per capita consumption of 1.3 barrels in the Pacific Northwest, and assuming the present population to be 4,643,000, the consumer demand will then approximate 6,040,000 barrels per year without consideration for future population growth. Adding to this figure the 2,000,000 barrels which will be required for Federal projects for several years, there is an apparent need for about 8,000,000 barrels per year by 1950.

As far as the total available cement for this area is concerned, one can add to the already available 8,800,000 barrels per year an additional 1,200,000 barrels which can be delivered from California. It is possible to take this cement by water from California to Oregon and still compete with the existing market. At present, in fact, the cement required by McNary dam, approximately 700,000 barrels, is being shipped from California by water to Portland, and barged up the Columbia river to the damsite.

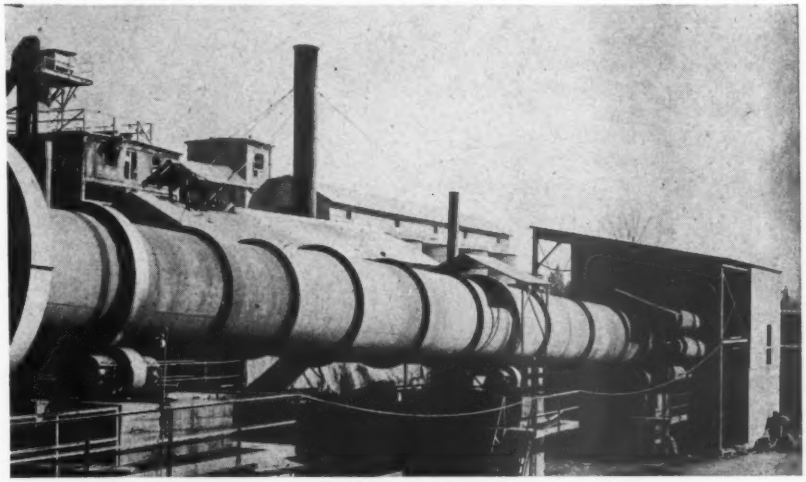
Assuming that 10,000,000 barrels of cement are available annually from the states of Washington, Oregon, California, and Idaho, and that we experience an 87½% plant operating efficiency (which we and most of the other plants do), this would make available to this area 8,750,000 barrels per year, which exceeds the apparent need by about 750,000 barrels.

In addition to this availability of cement as described, there is also available from the state of Montana an additional 650,000 barrels per year (annual total of 1,350,000 barrels) which formerly did not exist. Reason for this additional capacity is that Trident plant has recently doubled production.

Taking all these factors into consideration, therefore, it seems doubtful that there is any immediate need for further increased capacity in the cement business in this region. It is very likely that the demand for cement in California will decrease in the near future, and that state's capacity will no doubt find its way into the Pacific Northwest to supplement regional production, if and when the need arises.

VARIOUS CEMENT PLANT CAPACITIES

Name	Capacity per Annum
Montana	
Trident (doubled)	1,350,000 bbls.
Oregon	
Gold Hill	600,000 "
Oswego (new kiln)	1,000,000 "
Lime	450,000 "
	2,050,000
Washington	
Olympic	1,000,000 "
Concrete	2,000,000 "
Diamond	1,000,000 "
Grotto	600,000 "
	4,600,000 "
Washington (Spokane area)	
Metalline Falls (doubled)	1,200,000 "
Spokane Portland Cement Co.	650,000 "
	1,850,000 "
Idaho	
Inkom	300,000 "



• View toward discharge end of rotary kiln showing clinker cooling cylinders, and shed to house point of transfer of cement from kiln to the crusher over a conveyor belt.

Drawing and Stamping of Small Parts to Precision Tolerances

DRAWING and stamping small precision items, such as ball pen caps, seamless one-piece door knobs and screw shells for electric light fixtures on a production line basis, at a considerable increase in efficiency over commonly used methods, are accomplishments that have attracted considerable attention to Tubing Seal Cap, Inc., of Los Angeles.

They are the first in the West to apply this type of operation, which has been generally considered a New England specialty. It is another example of latent skills developed in the war through aircraft parts manufacturing successfully adapted to civilian production. In Tubing Seal Cap's case, it was the result of learning how to hold close tolerances for their patented aircraft closures and then developing automatic machinery in an effort to cut costs.

Their improvements in technique include spinning threads on parts simultaneously with stamping in place of rolling the threads on in a separate operation; fast hydraulic forming instead of the customary use of semi solids or rubber, an advance which includes bulging or expanding as a production operation; and the application of automatic radio controls to equipment.

These automatic controls on the transfer presses not only stop the machine, but also indicate at which station or stations the trouble has occurred. This prevents die breakage, and makes it unnecessary for the operator to watch the press constantly.

Parts produced include the following:

1. Aluminum and steel closures for tubing and hydraulic parts for the aircraft industry.

• Small precision parts drawn and stamped by Tubing Seal Cap, Incorporated. Across top row: Deutsch Company, anti-syphon valve cap; aluminum tubing seal cap; candelabra screw shell; friction catch. Row 2: Propelling mechanism for pencil; Schlage spring seat; Manning Manufacturing Company contact prong Saf-T-Plug. Row 3: Technical Glass Company lockset tumbler; cutaway receptacle cap; Eldon Manufacturing Company seamless doorknob; tubing seal plug. Row 4: Edison receptacle body; Edison base screw shell; Richmont sprinkler body. Each one of these parts shown conforms to closely specified tolerances.

2. Pen caps from copper alloy for the largest manufacturer of ball point pens in the United States. More than ten million caps produced in one year by one machine.

3. Edison lamp sleeves and caps, from brass.

4. Screw shells, to hold electric light bulbs, from brass and copper alloys.

5. Contact prongs for electrical assemblies, from brass and bronze.

6. Bushings, seat springs and strike boxes for lock sets and other builders hardware items, from steel and brass.

7. One piece stamped door knobs for some of the leading lock set manufacturers on the West Coast including Schlage Lock Company, Eldon Manufacturing Company and Hillgren Manufacturing Company.

The thread-stamper utilizes the solid end pistons of a Hercules diesel motor turned upside down as rams for the stamping operation working with conventional die shoes. One throw of the crankshaft feeds the metal into the machine and chops the scrap. Another throw counter-balances the pressure padding on the various die stations.

For lubrication the diesel engine's existing oiling system is used, thus providing pressure and permitting recovery of the oil in a sump, and reusing after passing through a filter.

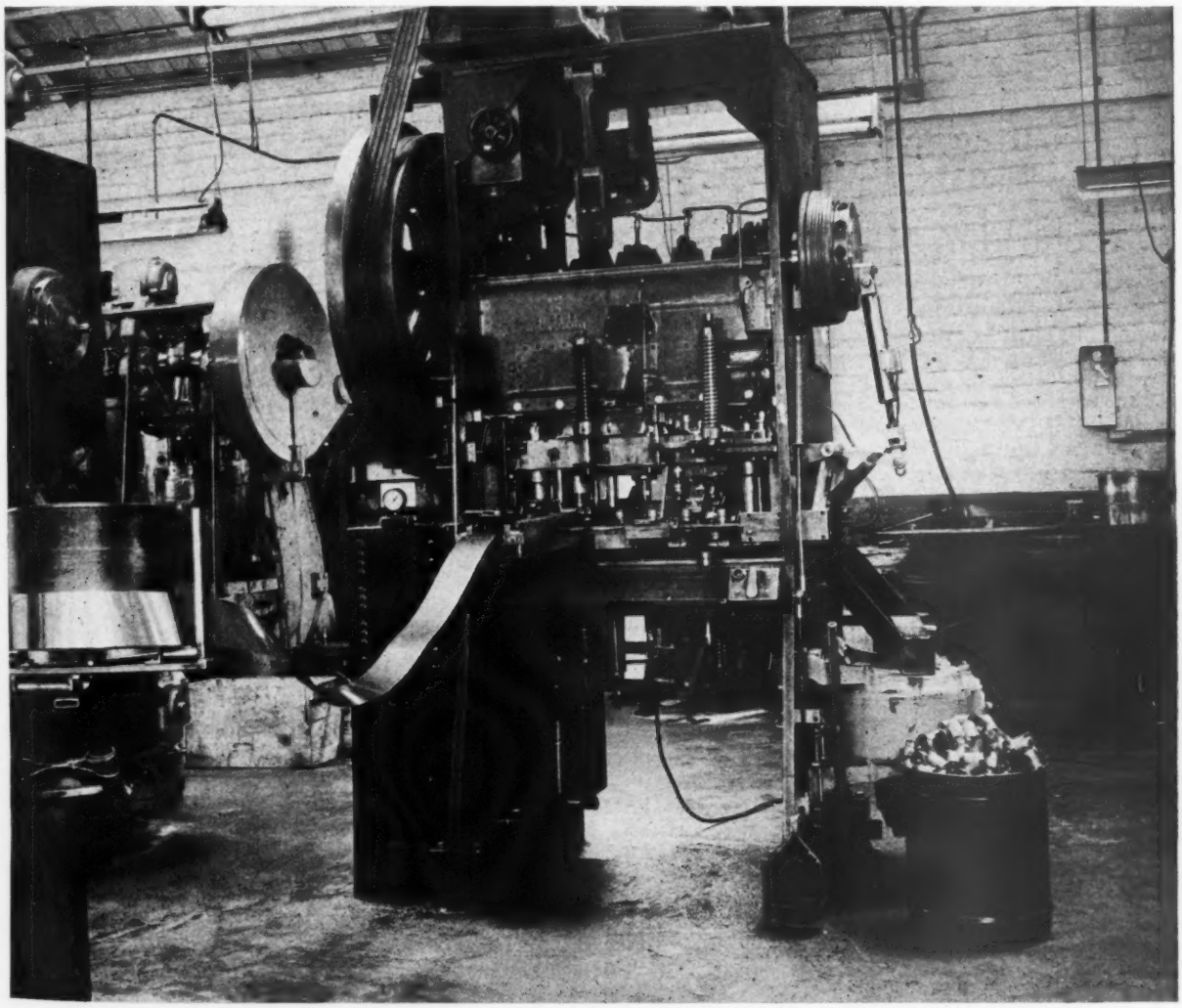
A flywheel has been installed on one end of the crankshaft and on one of the machines, to permit heavier work than the machine is designed to take. A helper motor mounted on top of the upside down engine base is attached to the other end of the shaft. This helper motor takes the twist out of the shaft, even though the overload may be 100 per cent .

An automatic clutch, operated by radio control, is coordinated with the various phases of individual and collective operations on the machine. The clutch and radio system work in conjunction with a Buick self-energizing brake drum, on the opposite side of the engine from the flywheel. Whenever there is an interruption of any kind in operation of the dies or machine, this radio control throws out the clutch and kicks on the brake.

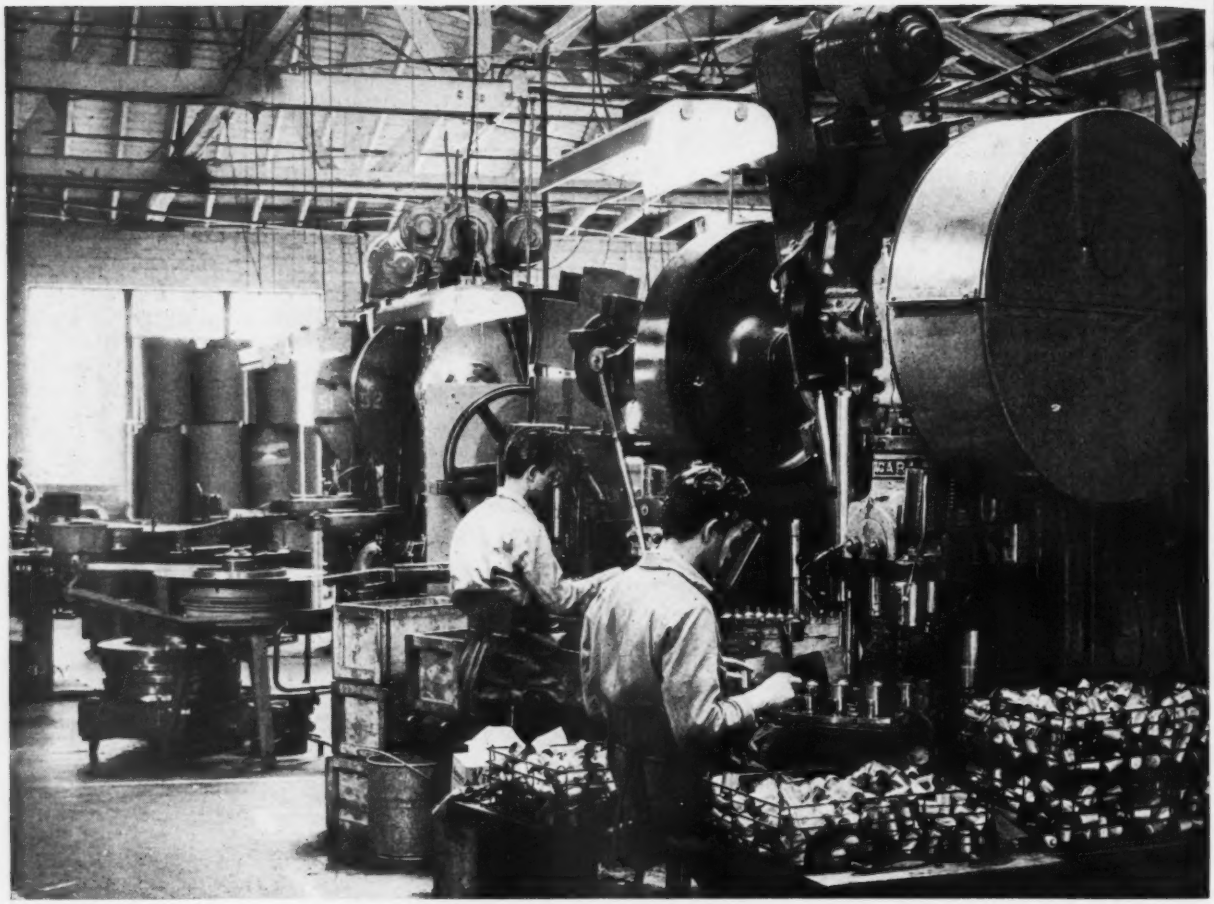
Parts being manufactured are advanced from station to station in a four-way slide motion, and are propelled by an eccentric taken off the Buick brake drum. Movement can be so regulated that on large diameter blanks it will advance them to double spacing. Thus the machine becomes a five-station machine, or on smaller parts a ten-station machine.

If the part is to be threaded, threads are spun onto the part during the stroke of the press by a patented development. But for this device, threading would have to be a separate operation on another machine.

Sharp edges can be taken off and spot-facing done in a separate operation on another machine of their own design at



• Close-up of Tubing Seal Cap's thread stamping machine in operation. Counterbalance padding is at top. Sized stock at the left advances into the machine as needed. Adjusting wheel regulates the amount of stock being fed. Buick brake drum can be seen at the right. This machine is entirely automatic, does not require a man's presence. Motor located at the bottom drives the thread spinner. Pieces in the drum on the right are stamped and drawn bodies of electric light switches.



• Machine operators feeding Niagara presses. In operation shown, stock is being drawn to shape. Thread stamper is in background.

the rate of 4,500 pieces an hour. By automatic operation on a small punch press geared down, lettering is rolled on pen caps at the same rate of output. Normally 2,000 units an hour is considered a fair speed on such a punch press, but the higher output is attained largely through more efficient methods of feeding.

When partially formed knobs come off the "Thredstamp" machine, they are annealed in a continuous stream through an annealer of Tubing Seal Cap's own design, still covered by the drawing lubricant and producing the practical equivalent of a bright anneal.

After annealing, the partially formed knobs are necked on a Niagara press containing a five-station dial-fed mechanism, one of the stations being the key to successful production of these one-piece door knobs. This station, for which patents are pending, produces a smooth dense interior cylindrical surface in the shank, thus enabling the subsequent expanding operation to be performed as a simple, fast punch press operation.

Containers reach the operator from a short piece of roller conveyor slightly inclined so that when he picks up one container to place it in position for supply for his left hand, another container rolls down into place alongside his right hand. Thus he is able to feed two knobs at the same time into the press which performs the five necking operations.

Next the parts travel on another short declined conveyor to a machine where a circular neck trimming operation is performed. After this they are placed on a steel belt which carries them through a hot soapy water system which fills the bulb and flushes the outside. At the end of the belt they arrive at the expanding operation.

Expanding is done on a flywheel type punch press, the operator pushing bulbs into the die as fast as the press will operate. There is available at this point 100,000 pounds per square inch hydraulic pressure developed inside the knob during operation. The bulb is expanded into whatever configuration is contained in the die cavity, and then delivered back to presses which put the customer's requirements on the shank, such as piercing and notching the neck, or piercing and drifting on the face of the knob.

Tubing Seal Cap began with a small experimental machine with only micro switch control, on which they were able to develop a high rate of output for stampings. On this machine, which is still in use, for example, they make 1,000 threaded aircraft closures of one size from 1¾ pounds of aluminum at the rate of 5,700 pieces an hour, holding the sealing surface nice enough to produce a hydraulic metal-to-metal seal to the extent of ½ lb. per square inch. Larger sizes are produced at the same rate of speed but of course require more metal. From this first machine they progressed to the present thread-stamper, built to their own design, which eliminates the necessity of a costly eyelet machine and at the same time reduces the number of operations required.

Demand for parts of various kinds has become so great that several U. S. Multi-slide machines have been installed to form metal into various shapes. When properly tooled, they have been able to maintain speeds up to 15,000 an hour.

Tubing Seal Cap's set-up does not require a large tool room. Instead, their requirements are for a few highly trained tool and die makers to make precision dies. As their work is mostly long run jobs, only a small engineering department is needed.

NEW PRODUCTION TECHNIQUES

Forged Hoes Competitive With Castings; Quality Is Higher

FORGING has long been considered a desirable substitute for casting and other inexpensive production methods only when it is necessary to fabricate certain metal articles with maximum physical properties. But at Hercules Forge Corporation of Los Angeles, recent production developments indicate that many articles can be forged for approximately the cost of equivalent castings with significant advantages in the form of improved product quality.

For example, this company recently received a $100,000 contract for heavy-duty agricultural hoes from the Brazilian Government after proving that such implements could be forged at a price comparable to the cost of castings which had been produced for more than a hundred years previously by English manufacturers.

Had to Be Shown

It was generally believed that the hoes could not be economically forged because of their peculiar design — which called for a large blade something like the blade on a meat axe, a handle seat with prong-like projections that could be bent so as to grip the surfaces of a wooden insert, and a hammer-like head (opposite to the blade and adjacent to the handle seat) which would permit each hoe to serve as a substitute for a sledgehammer.

Fabrication of the hoes was a fairly simple matter of pouring a suitable alloy into a mold, and machining the casts that were thus produced. But cast hoes were not completely satisfactory — being rather brittle and subject to fairly easy breakage.

Brazilian officials realized that forged hoes would be stronger and longer-lived than the cast implements, but were assured by manufacturing experts all over the world that the increased cost of forgings would more than offset any additional advantages that might be realized. This seemed to be justified on the following grounds:

(1) Forging would necessitate three or four special die operations, as compared with one simple mold casting operation.

(2) More machine work probably would be required to finish the forged hoes.

In the light of standard manufacturing practices, these assumptions were quite correct, and in essence indicated that as many as ten cast implements could be fabricated for the cost of one forged hoe. But Hercules executives, headed by President William Ford, refused to be impressed.

• William Ford, Hercules president, holds a hoe blade which was drop-forged at a cost of within 5% of casting, yet is a much stronger and longer-lived implement.

Briefly, they decided that forging could compete with casting in this particular case if:

(a) The need for special tooling could be minimized.

(b) High-speed drop forging machines could be used for greater productivity than could be achieved with the best of pressure-casting equipment.

(c) Little or no machine finishing would be required.

Plough steel stock was selected as the best of available forging materials for this particular work, and tool designer Walter Sebesta began preparing appropriate die specifications.

Dies for the initial operation were designed for the principal purpose of converting hot plough-steel stock into a very rough "blank" which (except for its thickness) had less than half the over-all dimensions of finished hoes. Then it was decided that dies for the second drop forging step should form the handle seat (with the aforementioned upper-lip prongs) and the adjacent hammer-like head.

In the beginning, it seems that two die operations would be needed to convert the remaining portion of the rough blank into an appropriate hoe blade; but Sebesta decided this could be done as a single operation with a forging roll — thus eliminating the cost of two complete die sets.

How It Was Done

Careful engineering computations then revealed that necessary finishing could be accomplished by sand-blasting, grinding, and sharpening the hoe forgings — a comparatively simple procedure in view of the steps normally required to finish castings.

Brazilian officials would have been satisfied if Hercules forgings were produced at two or three times the cost of cast hoes, but production statistics to date reveal that the difference in price amounts to less than five per cent. Greater savings can be anticipated in future work, because tooling and other preliminary work costs will be progressively reduced.

This, of course, does not mean that forging is economically and physically superior to casting processes in all circumstances, but it does indicate that where forging is a potential method of fabrication the question of costs can be confined to negligible proportions by good engineering and the most productive methods of using modern machine tools.

• MACHINISTS JOINT APPRENTICESHIP COMMITTEE OF ALAMEDA AND CONTRA COSTA COUNTIES, CALIFORNIA:

• Seated (left to right): James McKinney, California State Employment; David M. Wilson, Business Representative District Lodge 115, International Association of Machinists; Wm. Van Curen, Business Representative, East Bay Machinists, Union 1304, CIO; H. L. Bagnall (Chairman), Labor Relations Director, Moore Dry Dock Company; Roland Poinsett, President, United Iron Works; Wm. Harold Oliver, Vice President, Oliver United Filters, Inc.; Frank Drummond, East Bay Machinists, Union 304, CIO. Standing (left to right): P. W. Hovey, President, Hovey Machine Works; Joseph B. Callahan, International Association of Machinists, Local 284; George A. Stead, California Division of Apprenticeship Standards; John Brophy, East Bay Machinsts Union, Local 1304, CIO. Employer members represent the California Metal Trades Association, East Bay Division. They graduated 634 apprentices this year.

Apprentice Programs Will Bring "Vanishing Craftsman" Back

By WM. HAROLD OLIVER
Vice President, Oliver United Filters, Inc.,
Oakland, California

MANY persons enjoy mystery stories because of the unpleasant aspects of the tale, or because they get a kick out of the solution, or because they use them as an escape from every day worries. "The Vanishing Craftsmen" is no mystery story but the three elements given apply to what is about to unfold.

Up until "Pearl Harbor" the West was growing fast, particularly industrially. Then came a phenomenal growth and with the "impossible" accomplished the West took its place in the industrial sun. Will the West remain in the sun? Not unless Westerners cease trying to "escape" and are willing to face the facts and do something about it.

Untold thousands of people came West during the war and the influx still continues. Relatively few of all these thousands were highly skilled craftsmen and most of the so-called mechanics trained in war plants are still "Joe McGees," not deserving the title 'journeyman" or "craftsman"—a title carrying distinction of accomplishment in the true sense.

During the war the pressure was for production, production, and still more production. This meant apprentice training came to a virtual standstill and, what was worse, many apprentices drafted into the armed services never returned. Also appreciable numbers of journeymen went to war. Of those craftsmen who stayed home, death and retirement due to old age accounted for the loss of many thousands more.

Most readers of this article have a *general* idea of what has happened. But how many know what the average age is of their own journeymen or what a large percentage of them are over 50 years? What is the age situation in your industry? One of the unpleasant aspects of this story is the great gap between the younger craftsmen and the Vanishing Craftsmen—but industry must face the facts if the West is to continue to attract new plants and presently located plants are to successfully meet competition from outside these states.

Unfortunately "ageing" statistics for industries employing journeymen who normally must have served their apprenticeship are not available. However, the following examples can probably be considered typical of a very large number of other industries.

A survey of members by two unions, Carpters', Local 36 of Oakland, and Millmen's, Local 42 of San Francisco, shows the following for 1948.

CARPENTERS

36.50% of 3247 members were over 50
16.75% of 3247 members were over 60

MILLMEN

36.03% of 1267 members were over 50
18.68% of 1267 members were over 60

In November 1948 a survey was made of six typical machine shops in Oakland, California, employing 25 to 153 full-fledged journeyman machinists. The astounding results were:

	Over 50	Over 60
Shop No. 1	50.4%	14.4%
Shop No. 2	45.7%	24.6%
Shop No. 3	42.5%	7.5%
Shop No. 4	31 %	11 %
Shop No. 5	25.4%	6.7%
Shop No. 6	19.7%	5.5%

Whereas most apprentice training programs require 4 years, it usually takes at least another 2 years to produce a really efficient craftsman. If the above examples were only, say, 75% typical, it can readily be seen that there is going to be a shortage of skilled men for several years during the "catch up" period without taking into consideration the needs of new industries.

The Division of Apprenticeship Standards of the Department of Industrial Relations of the State of California estimates that a minimum of 25,000 more apprentices are need now even though there are already 35,000 in training in California today. Alameda and Contra Costa Counties alone need 6,000 in addition to 4,116 now identured in these counties. During the last 4 years, these 2 counties increased their manufacturing facilities by 651 new plants and major expansions of existing factories. Approximately 25,000 new jobs were created which made serious inroads into the already scarce craftsman supply.

Some readers may say "Sure, there is a shortage, so what? There are over 400,000 unemployed in California alone—why not give some of them a quick training course and do the work with semi-skilled workers?"

The answer will amaze most people. The West is primarily an area of *small* business establishments — establishments employing less than 100 persons according to figures obtained from the U. S. Department of Commerce, compiled by the Bureau of Old Age and Survivors Insurance of the Social Security Administration. The most recent available figures (1st quarter 1947) for the eleven Western states show that for *all* business establishments in the trades of manufacturing, construction, and repairs (trade normally employing craftsmen who must have served as apprentices) 97.1% had less than 100 employees. 85.4% employed less than 20 persons (total payroll).

Even though California has many well-known large industries, 96.7% of all the establishments in the categories listed had less than 100 persons and 84.6% had less than 20. These figures include all persons, both office and factory.

This just doesn't seem believable, does it? However, these are government figures and at the moment no more reliable figures are available; perhaps the next census figures may differ somewhat but not enough to change the statement "The West is primarily an area of small business establishments."

The proportion of skilled journeymen to semi-skilled workers is *much* higher in small factories than in large ones. Usually the latter are mass production shops where repetitive operations can be relatively quickly learned and only comparatively few skilled journeymen needed.

With craftsmen rapidly vanishing, with the West growing by leaps and bounds, with only about half enough apprentices in training to meet present needs, Management and Labor must wake up and do something about it. Pirating from other areas is no solution to the problem for similar conditions prevail throughout the Nation, as a whole. (See tabulation).

TABULATION BY SIZE OF EMPLOYMENT

Business establishments normally employing journeymen who have served their apprenticeship:

Includes: Manufacturing, Construction and Repairs.

Excludes: Railroad and Mines.

Compiled from figures released for 1st quarter 1947 by U. S. Department of Commerce, Bureau of Old Age and Survivors Insurance of the Social Security Administration.

PERCENTAGE OF TOTAL OF ESTABLISHMENTS

State	Total Establishments	Number of Employees					
		1-19	20-49	50-99	Less than 100	100-499	500 and Over
Arizona	2,364	89.0	7.4	1.9	98.3	1.6	0.1
California	43,025	84.6	8.7	3.4	96.7	2.8	0.5
Colorado	4,580	87.8	7.3	2.7	97.8	1.9	0.3
Idaho	1,906	89.4	6.1	3.0	98.5	1.3	0.2
Montana	1,911	89.5	7.3	2.0	98.8	1.0	0.2
New Mexico	1,804	89.3	7.3	2.3	98.9	0.9	0.2
Nevada	664	89.6	6.5	2.2	98.3	1.4	0.3
Oregon	7,932	84.1	9.0	3.7	96.8	2.7	0.5
Utah	2,119	86.1	8.9	2.7	97.7	2.1	0.2
Washington	9,732	84.6	8.7	3.6	96.9	2.6	0.5
Wyoming	904	90.6	5.5	2.7	98.8	1.0	0.2
	76,941	85.4	8.4	3.3	97.1	2.5	0.4
United States	527,818	80.8	9.9	4.3	95.0	4.1	0.9
Alameda County	2,919	80.8	9.5	5.0	95.3	3.8	0.9
Contra Costa County	652	86.0	6.5	2.9	95.4	2.8	1.8

Some corporations are large enough and some have been wise enough to set up excellent apprentice training courses. But as pointed out, most organizations in the West are small, too small to do this, particularly as they cannot afford to have teachers to give the theoretical related training so vital in making a skilled journeyman. Nor are they properly qualified to set up the necessary standards for either or both on-the-job and related training.

There is a practical solution if management, labor, schools, government, and the public will cooperate in expanding the plan which has been working successfully in some western areas for several years.

The Joint Apprenticeship Training Program adopted by most of the Western states and highly developed in many areas in these states seems to be the best solution to this problem offered so far.

Space will not permit detailing this plan. Suffice it to say that Joint Apprentice Committees (JAC) for any trade are composed of an equal number of labor and management representatives who set up standards of on-the-job training and in cooperation with the school departments they determine the standards of related training to be required of the apprentices in the special classes of the public schools. Standards adopted by any JAC in California must finally be approved by The Division of Apprenticeship Standards of the Department of Industrial Relations of the state before a graduate apprentice can receive a state certificate for journeyman.

JACs indenture apprentices for the term required by their particular standards and see to it that each apprentice is getting his proper training in the shop and in the school. No employer can indenture an apprentice under this program until his shop has been put on the approved list as being qualified to give the training set up in the standards. If an employer, after having been approved, fails to live up to the standards, the JAC removes his shop from the list and places the apprentice elsewhere.

If the apprentice fails in either the shop or school, his indenture is cancelled and he cannot receive the State Certificate.

The degree of success of the program is dependent on the composition of the JAC. The best committees are those made up of representatives from top management and labor who have a thorough knowledge of the practical requirements of a skilled journeyman — who are sincere and who are willing to meet regularly at frequent intervals without pay.

In Alameda and Contra Costa counties of California organized labor has done an outstanding cooperative job in this program. The writer speaks of these two counties because he has first hand information, being a member of the Machinists JAC for these counties.

Last year the JACs of Alameda and Contra Costa counties came to realize that there was a great lack of understanding as to the importance of apprentices and the dignity of becoming a skilled journeyman. So all 55 of the JACs decided to do something about educating their communities. They joined forces to conduct the first mass graduation of apprentices ever held in the United States. The ceremonies took place in the Oakland Civic Auditorium with Asst. Secretary of the Navy Mark Andrews as the principal speaker. He presented each of the 634 graduates with their State Journeyman Certificates. This year Secretary of Labor Maurice J. Tobin made a special trip to Oakland to address more than 650 graduating apprentices and approximately 40,000 undergraduate apprentices.

Things Helpful to Know About The Manufacture of Steel

By HUBERT C. SWETT
Assistant General Superintendent Bethlehem Pacific Coast Steel Corporation, Los Angeles, California

DEOXIDATION practices for rimmed and semi-killed steels are of course quite critical, if a satisfactory product is to be made. Considerable skill and judgment are required in deciding how much deoxidizer is needed so that the metal will not be over or under-deoxidized. Schedules for deoxidation of these grades are based on tapping carbon or iron oxide in the slag and ladle additions of deoxidizers are kept to a minimum, with final deoxidation being based on the action of the metal in the molds. The use of sodium fluoride in rimming steels with over 0.15% carbon has been of much value to us, resulting in improved rimming action, reduced amount of rise in the molds, and better surface on the finished product. A recent improvement in the use of this material is to have it packaged by the producers, which eliminates the handling and measuring of a toxic material.

Deoxidation practices vary considerably on semi-killed steel, depending on individual plant preference and the type of end product. Some will make a small addition of ferrosilicon to the ladle and will complete the degree of deoxidation desired by a mold addition of aluminum, while others will not use any ferrosilicon at all but will use aluminum or ferrosilicon for deoxidation when pouring into the molds, or as a cap.

Deoxidation schedules for killed steel depend to a large extent on the qualifications of the product that are necessary to meet the customers' requirements. We prefer to keep the addition of deoxidizers in the furnace to a minimum and rarely use furnace blocks, as present methods of chemical analysis are rapid enough to eliminate this practice. On high manganese and chrome steel grades it is generally necessary to make a furnace addition, and on low carbon grades silicomanganese will be substituted for ferromanganese. The use of exothermic chromium as a ladle addition for chrome indicates that it is superior to ferrochrome, although the initial cost is higher, as recovery is better and more certain. We believe that high temperature is a better promoter of steel cleanliness than deoxidizers.

Basic electric furnace slag and deoxidation practices are similar to those used in the open hearth, although much better control can be exercised. Single slag practice is used for ordinary carbon grades unless unusual conditions demand pulling off some of the slag and correcting the balance of the slag with new fluxes. Slag volumes are usually smaller than those in open hearth practice.

An important phase in judging steel quality is to have sufficient accurate data on the history of every heat so that the proper application can be made. At our plants the open hearth observation personnel collects this information for the use of the metallurgical department. It is their duty to see that prescribed standards for quality are adhered to and also to prepare detailed practice sheets that will give all pertinent data relating to the charging, working, deoxidation, tapping, and pouring of all heats.

• Temperature of molten steel, critical in quality control, is recorded by a pyrometer.

Industrial Know-How

It takes considerable time and supervision to train and educate an experienced observer. It is not only necessary for him to know what the requirements of the job are, but he must also use sufficient tact in dealing with the operating personnel to insure harmonious relations at all times. However, the time and energy spent in training a satisfactory observer is well worth while, as the collection of accurate operating data is essential to satisfactory quality control.

Approximately 70% of the ingot production in Bethlehem Pacific's West Coast plants is bottom poured in groups ranging from 8 to 24 ingots each. Regular ingots are 12" x 12" and 13" x 13" in size and weigh from 2,000 to 2,900 pounds. Balance of our production is top poured into molds 17" x 17" and 17" x 22", with special grades being hot topped. Ingot weights vary from 4,500 pounds for rimmed steel to 5,700 pounds for hot-topped killed steel. Mold coating is used only on top-poured ingots, in which case we use powdered pitch. Several sizes of ladle nozzles are

used, varying from 1¼" for top pouring to a maximum of 2½" for bottom pouring. Tapping and pouring temperatures are measured with optical pyrometers.

Ingots are heated for rolling either in soaking pits or continuous two-zone furnaces, using oil or natural gas for fuel. In most cases these furnaces and pits are equipped with automatic combustion controls and temperature recorders to insure proper heating and to prevent overheating. It is essential on certain grades of steel that are sensitive to thermal shock, that charging of ingots into soaking pits or furnaces be as rapid as possible to prevent cracking.

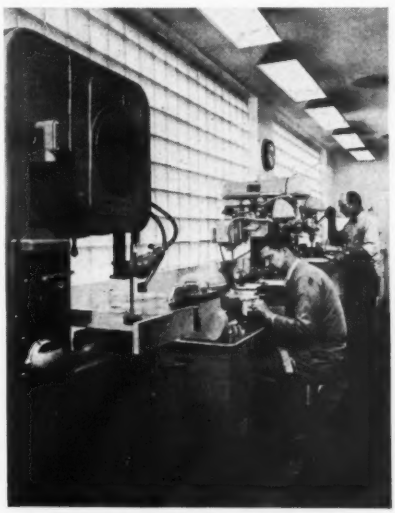
Careful Inspection

Products that require high standards of surface quality, such as forging grades, cold drawn rods, spring wire, cold-heading material, alloy spring steel, etc., must be rolled into blooms or billets in order that they may be inspected for surface defects. A four-side inspection is used and all areas requiring conditioning are marked. Practically all surface conditioning is by hand scarfing, and if defects are too deep seated to be removed in this manner, the material can be diverted or scrapped. Steels that are sensitive to thermal cracking must be scarfed very carefully in order to prevent surface cracking.

Finishing mill quality control is primarily a function of the mill operating personnel and should be supplemented by the Inspection Department. All inspectors work under the jurisdiction of the technical control organization. Mill inspectors are trained to be of assistance to the roller and his personnel by keeping them continuously advised about the physical characteristics of the finished product. Their usual routine duties of checking the section size, recording heat numbers, and securing test specimens are also supplemented by closely observing the product for rolling mill defects, such as laps, overfills, guide scratches, etc. On all rollings of rods, rounds and squares, where quality requirements demand a product better than merchant bar quality, upset tests are made and specimens etched in hot acid in order to reveal any surface defects that would possibly not be otherwise detected. Any material that the inspectors consider below prescribed quality standards is tagged and separated from the balance of the rolling. This material, if upon reinspection is still found unsatisfactory, is scrapped. Final inspection of product is made during the straightening and shipping operations to make sure that material meets the requirements for surface, straightness, bundling, and loading. The metallurgical department is the final authority in deciding whether a product has met all standards for quality and is suitable for the purpose intended.

If we can determine with speed and accuracy the physical and chemical properties of the product during various stages of manufacture, quality control will be more certain and easier of attainment. A most essential requirement to obtain this information is to have adequate and modern laboratory facilities that are staffed with experienced personnel. For this purpose we have chemical, physical, and metallographic laboratories at all of our plants, and also a central spectrographic laboratory. Spectrographic methods of analysis are of particular interest to us, and I would like to discuss briefly some of the benefits that can be obtained from such an installation.

• **Making a laboratory carbometer test.**



• **Sample preparation room in Bethlehem Steel Co.'s spectrographic laboratory.**

The most obvious characteristics of spectrographic methods are their extreme sensitiveness (which permits the determination of many elements which are often undetected by conventional methods) and the speed with which results may be obtained. All elements that react favorably to spectrographic methods are determined simultaneously on one photographic plate. In conventional chemical methods each element must be determined individually.

• **Making a slag test in open hearth control laboratory by comparing color and texture with samples of known analyses.**

Once the necessary preparations have been made and standards and calibrations established, many analyses can be completed in 30 minutes or less.

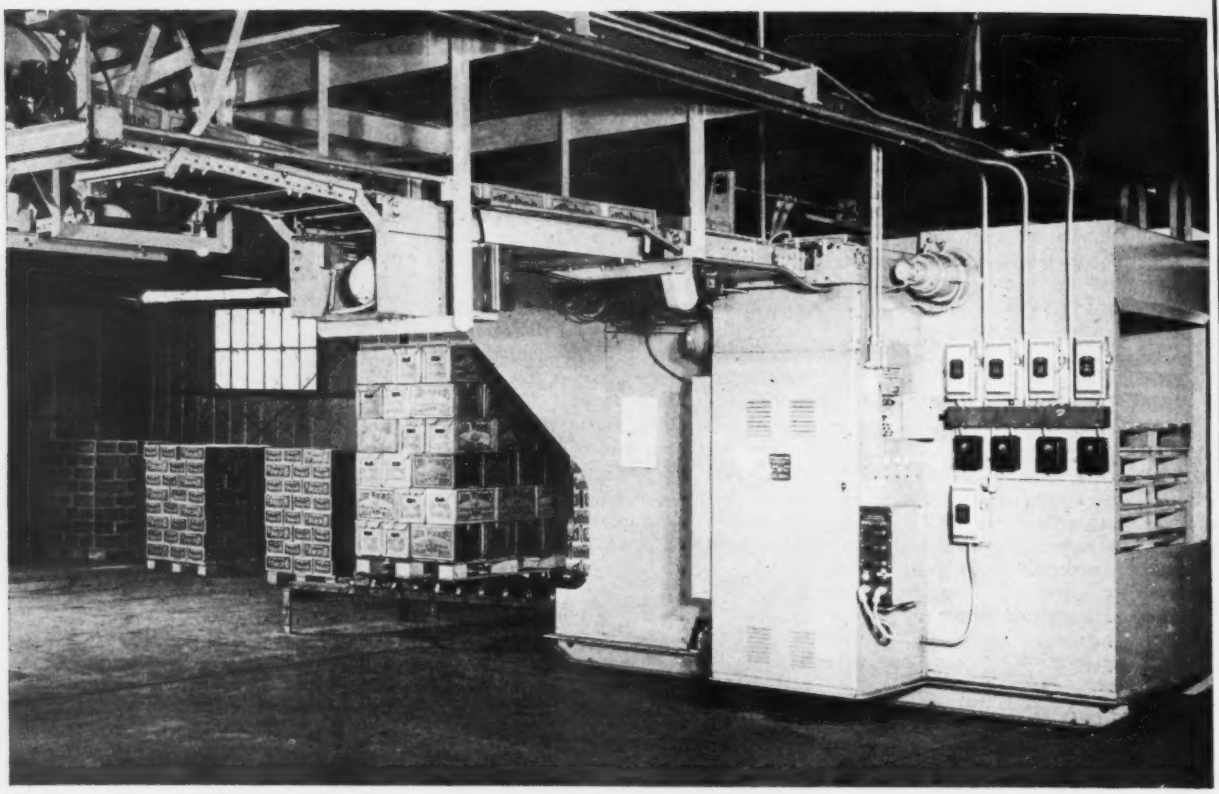
In the manufacture of quality steels it is of primary importance to know the composition of the molten metal during the refining period, and for quality control purposes the greater the speed with which an analysis can be made, the greater the possibility of a more accurate control. Although chemical methods of analysis are feasible for all of the important elements encountered in steel making, a large number of them require considerable time and expense, and therefore cannot be solely applied for control purposes. It is in this field that spectrographic analysis excels, due to its accuracy and speed.

Quick Analysis

Previous to the introduction of spectrographic methods it was impractical to determine all of the residual elements in steel during the refining period, due to the length of time involved and the extremely large force of chemists that would be necessary to do this work. With spectrographic equipment the analytical results can be obtained in a few minutes instead of hours, which makes possible the determination of the composition of the steel in the furnace during all stages of refining. If the melt test shows that the steel is off composition, the desired grade can be re-scheduled to meet the quality desired.

Successful quality control depends upon the recognition of all the essential properties required to make a satisfactory product, and on adequate facilities and experienced personnel to provide these properties at minimum cost, both to producer and consumer.

This article, second in a series of two, concludes Mr. Swett's discussion of quality control in steel manufacture.



• With this Lamson automatic pallet loader, Pacific Brewing and Malting Co., San Jose, Calif., have speeded up warehouse operations. Empty pallets are placed in machine at right. Cases of beer come down conveyor above, are placed on pallets which come out on left.

Automatic Palletizing Speeds Up Stowing, Cuts Down Confusion

AT Pacific Brewing and Malting Company, brewers of Wieland's Beer in San Jose, California, it used to take three men almost four minutes to hand-stack a pallet load of the same size cases of beer. But if the brewery happened to be turning out two different sized cases on their production line, (which is the general rule) a separate crew of men would be required for each palletizing operation.

When the company started figuring on installing a third production line, with a still different size case to be used, labor problems on the warehouse end began to become topheavy, and demanded a solution.

Now the problem has been solved—with the result that one man and a machine can work together all day long—taking whatever size cases happen to come along—and automatically palletize them at the rate of about two minutes or less per pallet.

How this was accomplished with an estimated saving of 32 manhours per 8 hour shift is a tribute to both Allen S. Rose, chief engineer of the brewery, and the Lamson Corporation, manufacturers of the automatic pallet loader. This machine was originally ordered from Production Aids, in Los Angeles, before that firm was taken over by the Lamson Corporation.

During the brewery operations in production, empty cases are fed into the plant on a conveyor system from one of the warehouses. These cases are taken directly to the labeling machines.

Meanwhile, the beer is brewed in a central spot, and bottles are filled on each of two separate lines. For instance, one line may run pints and the other may run quarts; at another time, one line may run cans and the other may run Wieland's seven-ounce bottles, depending upon demands from the trade. A third bottling line is being set up now, to further increase production and eliminate bottlenecks.

All these bottles of beer are then fed into the labeling machines, with one labeling machine for each bottling line. At the labeling machines, when bottles are ready for shipment, men who tend the machines fill the empty cases from the conveyor, which terminates at the labeling machine.

Whenever materials are to be handled, there some business organization is either making or losing money, perhaps an amount large enough to mean the difference between profit or loss on the entire operations of the company. For that reason, "Western Industry" provides a continuous editorial service to its readers on materials handling developments and problems. The accompanying article is another of "Western Industry's" regular features on handling of materials.

Filled cases are then placed on another conveyor system, which ascends at an angle of 60 degrees and runs through a hole cut in the wall, in order to deliver them to another conveyor track which will introduce the cases into the automatic pallet loader, located at the far end of an adjoining warehouse.

Separate Lines

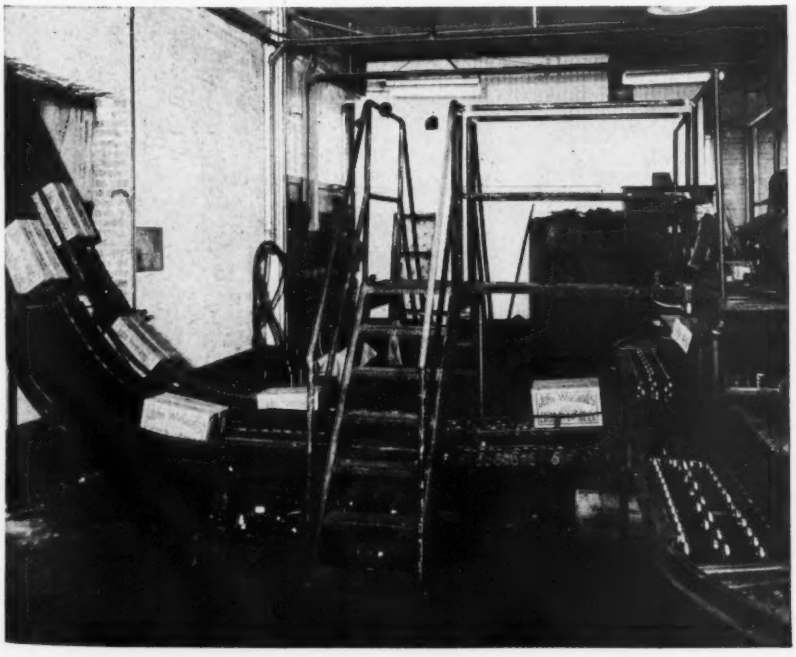
Separate conveyor lines must be provided for each size case, to keep them from being mixed on pallet loads. The third bottling line will require still another conveyor line from its labeling machine all the way to the pallet loader.

These tricky (because of building construction) conveyor systems were rigged by Rose from bits and pieces of Mathews, Lamson, and some Production Aids equipment which happened to be available, and they served his purpose admirably. Until the advent of using cases which required a glued top. Then a glueing machine had to be installed in such position as to intercept these lines between the labeling machines and the pallet loading operation.

Knotty Problem

How to cut into the lines with this new machine and still keep the cases from being scrambled was another problem for Rose, who came up with an ingenious solution. He installed the glueing machine directly above the labelers, in a loft on the second floor. Then he devised and had constructed in the brewery's shops, a specially curved conveyor track which would

• Above: The two separate conveyor (accumulator) lines converge at this point. Note the two different sizes of cases ready to be palletized. Below: Labelers at extreme right. Conveyor lines coming around them carry empty beer cases ready to be filled. Full cases are then placed on conveyor system at the left, and taken up the 60 degree incline to the accumulator lines.



divert the regular production run from the labeler to the gluer—and then from the gluer back to the regular conveyor track which leads directly to the palletizer.

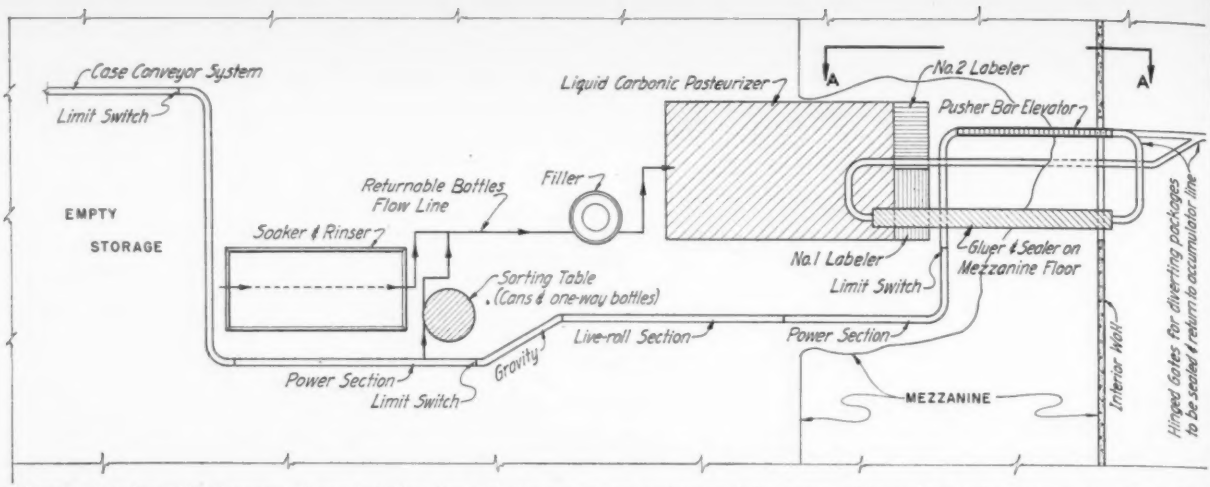
Special Ramps

Two hinged ramps had to be constructed, which are track switches as well as conveyors, and which were made in such a way that when not in use they would be out of the way; yet when in use, they would operate as an integral part of the system and maintain a constant flow of goods. No trouble has developed in this setup, and none is expected.

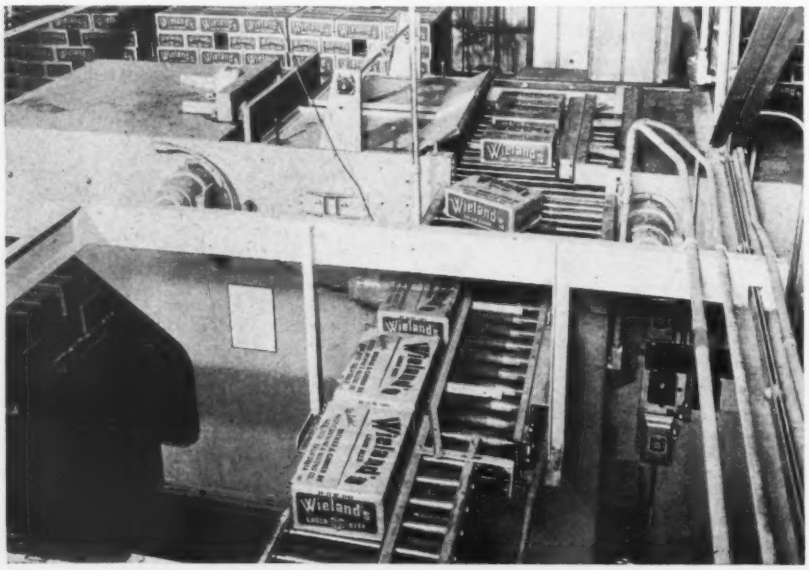
Accumulator Lines

From this point, the conveyor system to the palletizer is considered to be part of the palletizing operation. Each of the conveyor lines from this point is known as an "accumulator line," since the cases are allowed to accumulate on the tracks until a full pallet load is ready to be taken.

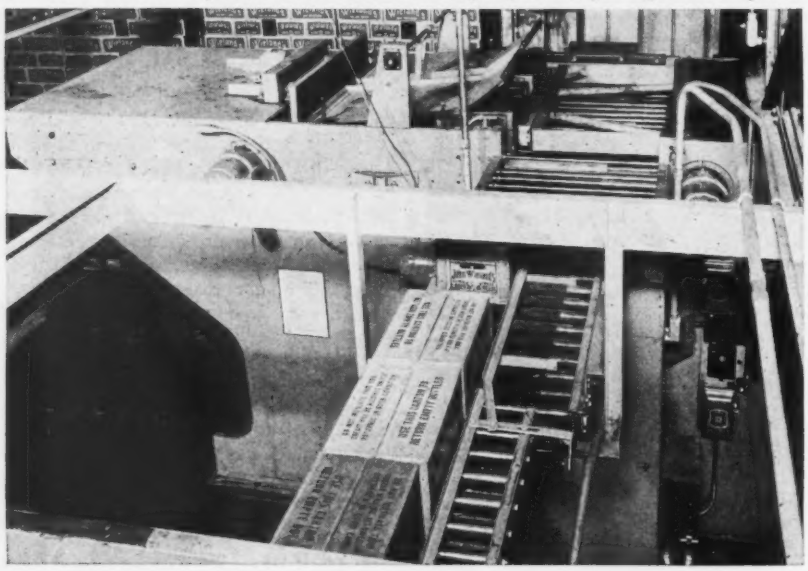
Using one size case, for instance, 60 units constitute a pallet load. Another size



• **Above: A schematic diagram of one bottling line and the conveyor system to take cases of beer from labeler to accumulator line.**



• **Above: Showing how cases are automatically turned to stack criss-cross for stability. Ram shown at normal position. Below: ram at full open position, placing cases on pallet.**



case may require 80 for a pallet load. At a predetermined distance from a limit switch on the palletizer, a distance equal to the length of 60 (or 80) cases, is located a photo-electric cell. After the required number of cases has accumulated on a line, the last case (number 60, for example), intercepts this photo-electric eye longer than seven seconds, and the automatic palletizer opens the line to accept these 60 cases for one pallet load.

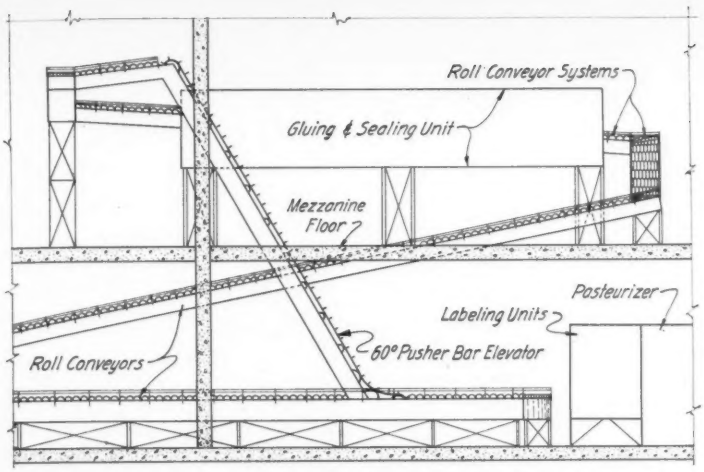
Electric Brain

Meanwhile, cases are accumulated on the other line, and as soon as the required number (80, in this instance) have accumulated and the last case (number 80) intercepts the photo-electric eye for longer than seven seconds, that line is then loaded and ready for palletizing. As soon as the first line is cleared and the machine is again open, it will automatically open the second line after locking the first, and then start accepting the 80 cases for palletizing. If only one line is running at a time, the machine will automatically shut down after each pallet load until the required number of cases has accumulated on the line. Then the photo-electric cell will relay this information to the machine, which will start up and palletize the load.

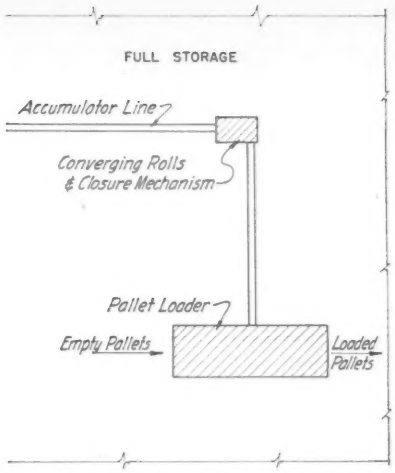
24 Volt Hookup

This automatic pallet loader, operating on a 24-volt system, is an electronically-controlled machine which is preset for definite stacking patterns by stack pattern cartridges, and requires only the flick of a switch to change pattern. Once it is set for a production run, using two different patterns as required by the different size cases on the lines, the loader automatically switches to the pattern indicated by the line it is servicing.

Seven different shapes of cases can be handled by this machine, which will turn,



• Above, left: enlarged cross section of A-A on page 46, showing conveyor arrangement.



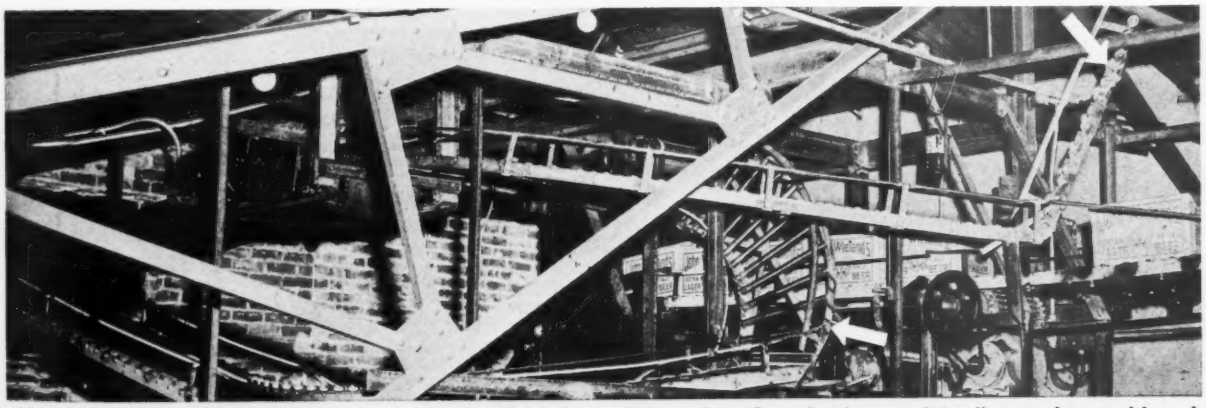
• Above: Accumulator line to palletizer.

interlock and stack them at the rate of 28-30 cases per minute, in the predetermined stacking pattern.

In operation, cases are fed into the machine from the conveyor lines by means of accelerator rolls, which automatically space the cartons. The accelerator rolls are driven by a motor controlled by a Square D starter, as are each of the other five motors used in the machine. Square D limit switches are used to stop and release cartons entering the machine in accordance with the sequence demanded by the stack pattern cartridge.

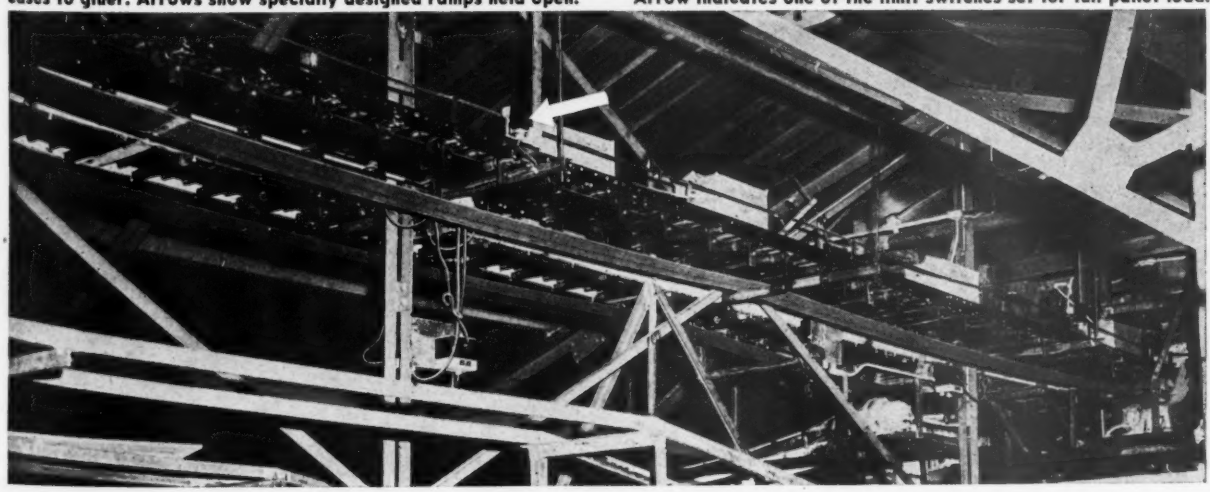
Before the conveyor rollers pass the packages into the pallet loader, the boxes are rotated, if so required by the pattern being used. All cases are counted by a photo-tube.

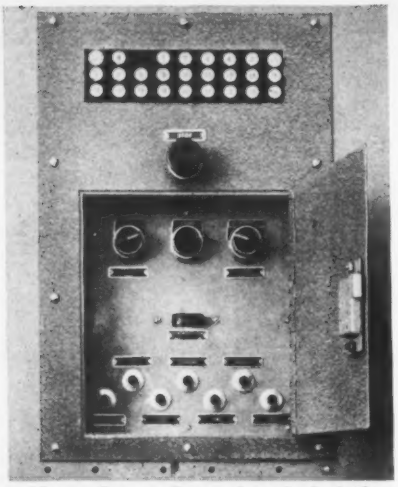
Some of the Wieland cases have split tops, folded in, and when the cases bumped over the conveyor rollers the split tops tended to unfold and open up, thereby clogging the palletizing operation. Consequently Rose designed and had constructed in his shops two units now added to the palletizer: one is an automatic top-folder to lay the tops down in proper manner; the other device is a floating shoe which is also above the cases close to the



• Above: Showing Rose's arrangement of conveyors to sidetrack cases to gluer. Arrows show specially designed ramps held open.

Below: view of overhead accumulator lines, and general layout. Arrow indicates one of the limit switches set for full pallet load.





• Above: Square D panel control station.

point where they are rammed into the stripping plate. These shoes ride along the top of the cases, keeping them closed as well as preventing bouncing.

After the proper number of cases has lined up on the machine's conveyor, they are pushed by a ram onto a steel stripping plate. When the proper number of rows are on the stripper plate, it retracts and allows them to rest on the pallet, which has moved into position beneath it.

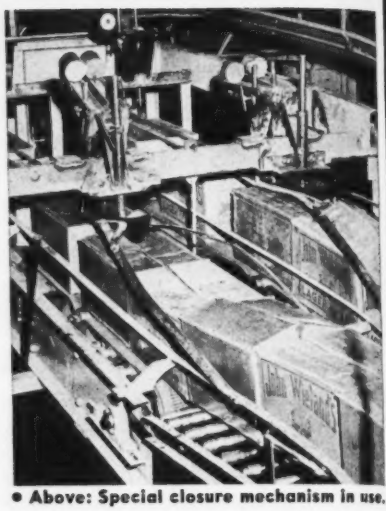
The pallet itself rests on a Lowerator. When the stripper plate has discharged the first tier onto the pallet, the Lowerator descends far enough intermittently to receive the correct number of succeeding tiers. When properly loaded, the pallet lowers to the bottom, rests on a pallet conveyor, and moves out of the machine ready to be picked up by a fork lift. At the same time, a new pallet is released from the pallet hopper, moves forward to center on the Lowerator, and is raised to position for another pallet load.

Each pallet load is regulated according to and A and B sequence setup by the stack pattern cartridge, so that it loads the cartons with an interlocking strength.

Pallets had to be used which would fit into this machine, and Rose had 4,000 of them constructed, each 40 by 48 inches. Cut shooks were purchased and assembled at the brewery, with all corner ports bolted through. Each pallet cost around $4.50, and has a life expectancy of two years, plus.

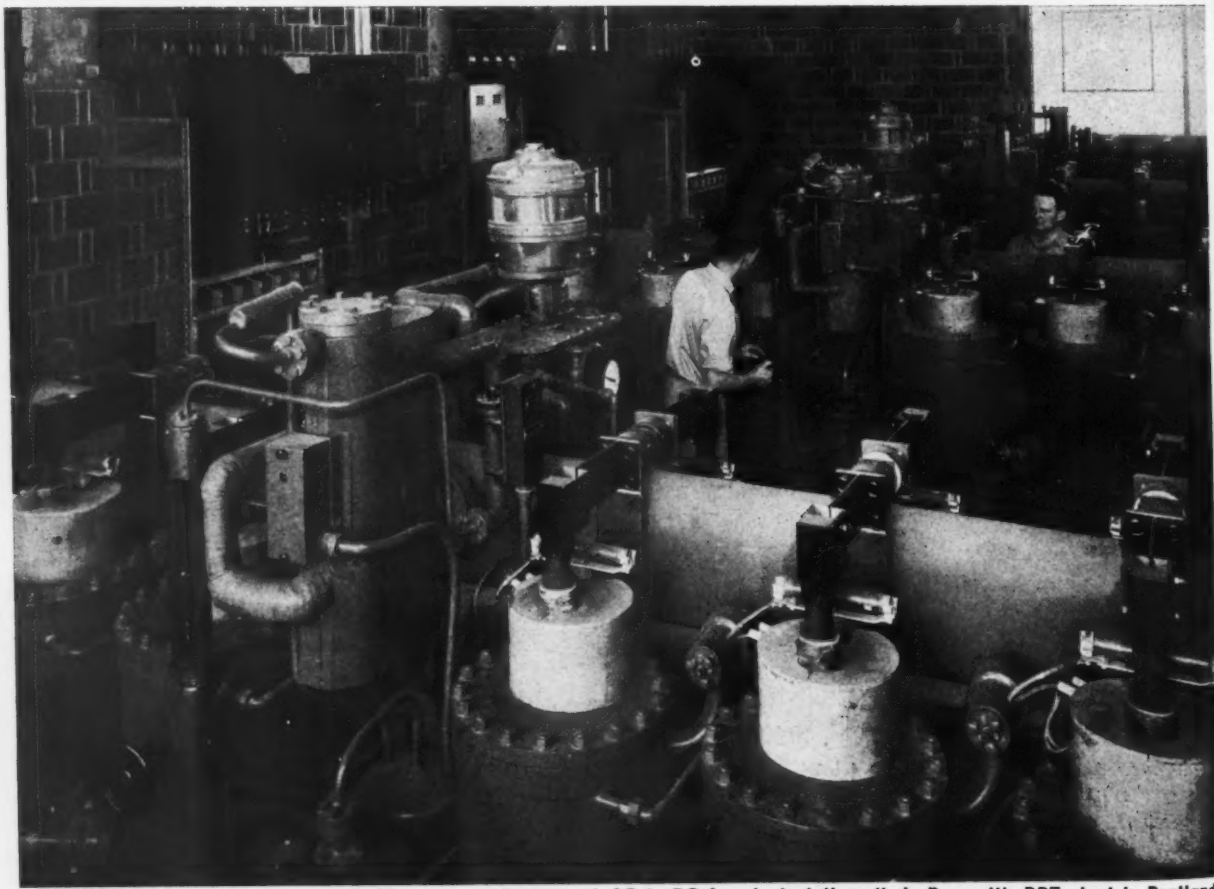
Wieland beer trucks now haul pallet loads of cases, which are put on the truck (850 cases per truckload) by one man with a fork lift in 15-18 minutes. Before palletizing, three men used to take two to two and one-half hours for that job.

Although the automatic palletizer takes

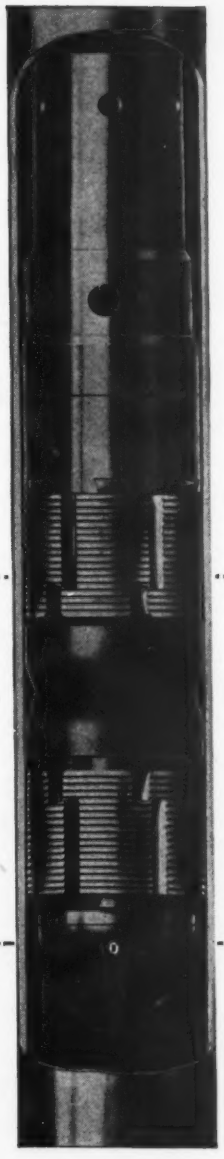


• Above: Special closure mechanism in use.

up about the same space as the former manual loading operation (200 square feet) it operates at a cost of less than a dime an hour and saves at least 32 han-hours per eight-hour shift. It is practically foolproof, and with a semi-annual inspection and an annual overhaul it seems good for a long life. Breakage losses have been drastically reduced since its installation, and warehouse efficiency has considerably improved.



• Northwest electro-chemical growth. Mercury arc to convert AC to DC for electrolytic cells in Pennsalt's DDT plant in Portland.



Drillable Bridging Plug made by the Lane-Wells Company, Los Angeles, California, whose successful setting depends on the shear strength of two small pins of Revere Herculoy. These plugs vary from 38" to 58" in length.

These are the two small pins, made of Revere Herculoy to standard shear strengths, thus assuring proper setting of the Tripset plug. Pins are shown actual size.

Dependability protected through standardized-strength Herculoy

● Here is a case in which the successful operation of a large and somewhat complicated device depends upon one of its smallest and least expensive parts. The parts are two pins of Revere Herculoy. The device is a plug employed to seal off an oil well at any desired depth, to prevent taking oil or water from lower strata.

Proper setting of this plug within the well depends on those two small pins. They must shear at exactly the right load, imposed by a special setting tool. If the pins should shear too easily, the plug might not be securely set in the well and might fall to the bottom; if the pins were too tough, the plug might not set at all. From the material standpoint, successful operation of a device costing as much as $310.00 depends on the uniform shear strength of a few cents' worth of rod.

It was to assure that uniformity that the Revere Technical Advisory Service was called into action. Studies were made of the needs, tolerances specified, and means devised to assure meeting them. The specifications when finally drawn up were rather unusual, and their fulfillment is another demonstration of Revere's ability to turn out special orders when absolutely necessary. Incidentally, Lane-Wells Company, maker of the Drillable Bridging Plug, also uses Revere phosphor bronze, strip brass, Herculoy rod and free-cutting brass rod for other parts.

Before you place your next order for copper and copper alloys, get in touch with the nearest Revere office. And remember, if you are having any difficulties in the employment of copper and brass mill products, the Revere Technical Advisory Service will gladly collaborate with you.

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Military Development Plans Open New Civilian Industrial Fields

Research forges ahead on several fronts; Sharp break in steel prices perks up manufacturers; Building activity slows down

LOS ANGELES—A trifling item of $14,000,000, appropriated in the waning hours of the 80th Congress, has laid the groundwork for research of great potential import to industry of this area.

That amount will cover about half the cost of expansion just begun at the Navy's Guided Missile Test Center at Point Mugu, located about 60 miles north of Los Angeles and adjacent to Port Hueneme, principal war-time outlet for military supplies bound for advance bases in the Pacific.

At this writing, Washington is attempting to decide between Point Mugu and the Banana River Naval Station in Florida, as the permanent site of a much greater operation — a king-sized guided missile center costing, not a mere $30,000,000, but $200,000,000. Regardless of the outcome, however, the enlargement of the Mugu base already started is significant, for just such government-sponsored research at California Institute of Technology led to the dramatic emergence of the rocket into a major weapon, and to the birth overnight of a new industry in this area, with war contracts running into the multi-millions.

Look in the Crystal Ball

Only scientists and top military experts can look far ahead in the fast-moving picture of scientific warfare, but top brass now is guardedly hinting of new missiles able to follow a moving target no matter which way it tries to turn. Local industrialists are becoming convinced that their assignments in future armament programs will at least be wierdly fascinating.

The situation reflects a trend that has been manifest since the hectic days of the last war. More and more, opportunities for job shops to get lucrative work from military procurement sources have narrowed down. Prime contractors generally are prepared to do their own light assembly.

At the same time there has been continued opportunity for small firms to do modest but worth-while specialty work in certain fields, notably electronics, radar, hydraulics, optics, precision instrument making, and others basic to experimental and development work. So long as military budgets are limited to minimum needs for preparedness and for keeping abreast of scientific progress, i. e., so long as we are at peace—this situation can be expected to continue.

Markups Are Down

It should be remembered, however, that the military will spend nearly $13,000,000,000 during the next fiscal year. Like civilian buyers, the men who will place these contracts have become exceedingly careful how the taxpayer's money is disbursed. Their caution is well justified by the fact that many would-be bidders still reflect a certain carry-over from the easy-money philosophy of boom days.

Recently, for instance, a procurement agency advertised for bids on a strictly military item. It drew more than a hundred inquiries. When the bids were opened, they were found to range from less than $10 per unit, to more than $125.

What did the procurement men, burdened with the responsibilities placed upon them by Congress, do? Just what any sensible purchasing agent would do. They ranked the bids in order of price, then sent men out to check up on the bidders.

At the lower end of the scale they found many neophyte manufacturers who, used to doing business "out of the hip pocket," obviously had no idea of their costs. In some cases they were offering the item at less than the actual costs of the raw materials, assuming that quality specifications were met. Most of them, had they been awarded the contract, would promptly have gone broke.

"A bankrupt contractor is no help to a military program, even a preparedness program," one of the procurement officers remarked wryly as he sidetracked these bids, along with those from shops whose tooling was inadequate, or whose financial and other qualifications showed they would be quite unable to qualify for the surety bond required.

At the other end of the scale, the field men found a fair sprinkling of bidders who were apparently unaware that the day of the "quick buck" and gray market prices definitely has passed. Mark-ups that were common on post-war gim-crackery simply won't get by on military orders.

Having eliminated the hopeless cases, the procurement officers went down the line and selected the lowest bid that met specifications in every respect. It was in the neighborhood of $25. The lucky bidder may not make a fortune, but if his performance record is good and his product stands up well, he has laid the foundation for a permanent place in the blueprint for industrial mobilization.

Atomic Power Plants

Military developmental work now under way here is certain to open new civilian fields of industry as well. Some local industrialists, reading that the first jet-propelled railroad trains are to be put into operation this summer—one in England, one in Switzerland—were reminded that Northrop Aircraft two years ago announced development of a turbo-dyne of 10,000 horsepower. Arrangements were under way to fit the power plant into a Union Pacific diesel locomotive when the Army suddenly ordered Northrop to side-

(Continued on Page 52)

NEW BULLETIN points the way to lower materials-handling costs

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Whiting Trambeam is a flexibly suspended overhead materials-handling system. It is engineered to assure that cranes and carriers roll freely at all times, and that strain is minimized on supports and building structures.

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L. A. REGIONAL

(Continued from Page 50)

track the scheme and concentrate on military developments.

Meanwhile other research now going forward to find materials capable of withstanding the terrific temperatures created in jet planes offers hope of discoveries that will start a chain reaction, unlocking another field of immense civilian importance. One of the major problems in atomic power development is that of taming the colossal energies of atomic fission, converting them into manageable forms of heat and electricity.

For instance, one plan contemplates transferring energy by means of a circulating fluid consisting of molten metal which would flow through generating equipment, converting heat to steam, then steam into electrical power.

Not So Fantastic

Such fantastic ideas now seem more plausible, since one recently-discovered alloy of tungsten, chromium and cobalt tested in the searing temperatures of jet engine exhausts has outlasted eight stainless steel nozzles. This modest but important step in the right direction, a by-product of research in an Army bomber contract, hints that other bottlenecks may be opened up soon.

Like rain after prolonged drouth, a sharp break in steel prices has brought a pleasant sensation of relief to manufacturers of this area. By the customary irony of fate, many of those benefitted were hardly in a position to enjoy it thoroughly. They were too busy anxiously watching the outcome of declines in the markets for their own products.

The break in steel, however, came exactly where everybody hoped it would—in the gray market, the premium charges, and in the extra cost of conversions forced by market scarcities.

All hands were glad enough to attend burial of the gray market, even though it was directly tied up with recent drastic declines in the general price structure of such items as refrigerators, stoves, and other home appliances.

Everyone was well aware that lower material costs represent the only way out for many a manufacturer, confronted almost overnight with a buyers' market for his wares.

Immediate Effect

One of the immediate effects was Kaiser's move to grant freight allowances in certain Western areas on shapes, carbon and allow bars, hot and cold-rolled strip, and hot rolled sheets from the Fontana mill. Benefits will be felt chiefly in the San Francisco and other more distant areas, but growing competition among Pacific Coast steel producers also has been augmented by reappearance in this market of several independent Eastern mills which are absorbing freight charges on westbound shipments. A break in zinc has brought a realignment also in galvanized prices.

News now is being awaited from the I.C.C. in Washington, which has heard arguments for and against continuance of the reduced rates in effect on steel products westbound from Geneva. Should I.C.C. fail to heed the presentation made to them on behalf of the Western States Council's steel committee, consumers in the West will have to pay an increase amounting to $5.41 per ton.

How far the downward price movement will go is conjectural. Most steel men say it will level off shortly. But scrap now sells for about $20 a ton less than last January, a drop of nearly 50%. Despite the decline in this major ingredient, and a slight but perceptible softening in the price of coal, the price of steel billets is but a few cents lower.

Regardless of any future price readjustments, the passing of premiums, gray market "deals," and conversions is shaking the manufacturing economy out of its unreal price structure and down to the solid bedrock of normality. With supply lines no longer pinched, the manufacturer can give his undivided attention to fundamental matters of product development and marketing.

Industrial Milestone

A marker in western steel progress has been passed with closing of the Vulcan mine near Kelso. It was the source of the first ore to flow in Kaiser's Fontana blast furnace, late in 1942. The deposit, though relatively expensive to extract, has served its purpose well. More than 2,500,000 tons of its ore kept war-busy Fontana running full blast until post-war conditions finally permitted building of 50 miles of railroad to the Eagle Mountain deposit. Vulcan is now being closed because to continue operations would mean the stripping away of huge quantities of overburden to enlarge the pit, or else shaft mining, either method being entirely too expensive.

This area still teems with schemes for manufacture of light, inexpensive cars to meet the seemingly insatiable demand for cheap transportation. Two more have just been announced. One is a plan advanced by Del Mar Motors, of San Diego, for a four-cylinder, five-passenger sedan made of nationally known standard parts, with a Continental 63 hp engine. It would retail at $1170. Body components would be manufactured by eleven different companies and assembled in a former Consolidated Vultee war-time building. Later, assembly plants would be set up also at Fort Worth, Chicago, and Philadelphia. Outlets in Europe already are said to have been arranged by the sponsors.

A second creation, named the "IMP," is planned by R. Stanley Griffin, who would manufacture it at Burbank to retail around $500. Weighing a mere 475 pounds, with a rubber-mounted engine in the rear delivering 7½ horsepower, it would zip through the streets at a top speed of 35 miles an hour. A tubular steel frame and laminated glass body would permit the little vehicle to be lifted at any corner with ease. All shifting would be push button and three gallons of gas would propel it up to 240 miles.

British makers of the several brands of light automobiles being marketed in this country are reported disturbed over the effect of recent price cuts on standard U. S. models. Meanwhile plans for marketing of another of the new cars—the Davis—have precipitated an investigation into franchises allegedly sold to would-be dealers. So far, only hand-made pilot models have been produced. Fate of the novel three-wheeled vehicle now appears to rest with local courts, in which affairs of the enterprise are being straightened out.

Building Activity

Building activity, usually a good barometer of conditions in this normally fast-growing area, has been disappointing lately. The usual spring rise was delayed and when it came, it was much below the rate last year, when it hit the second highest point in local history.

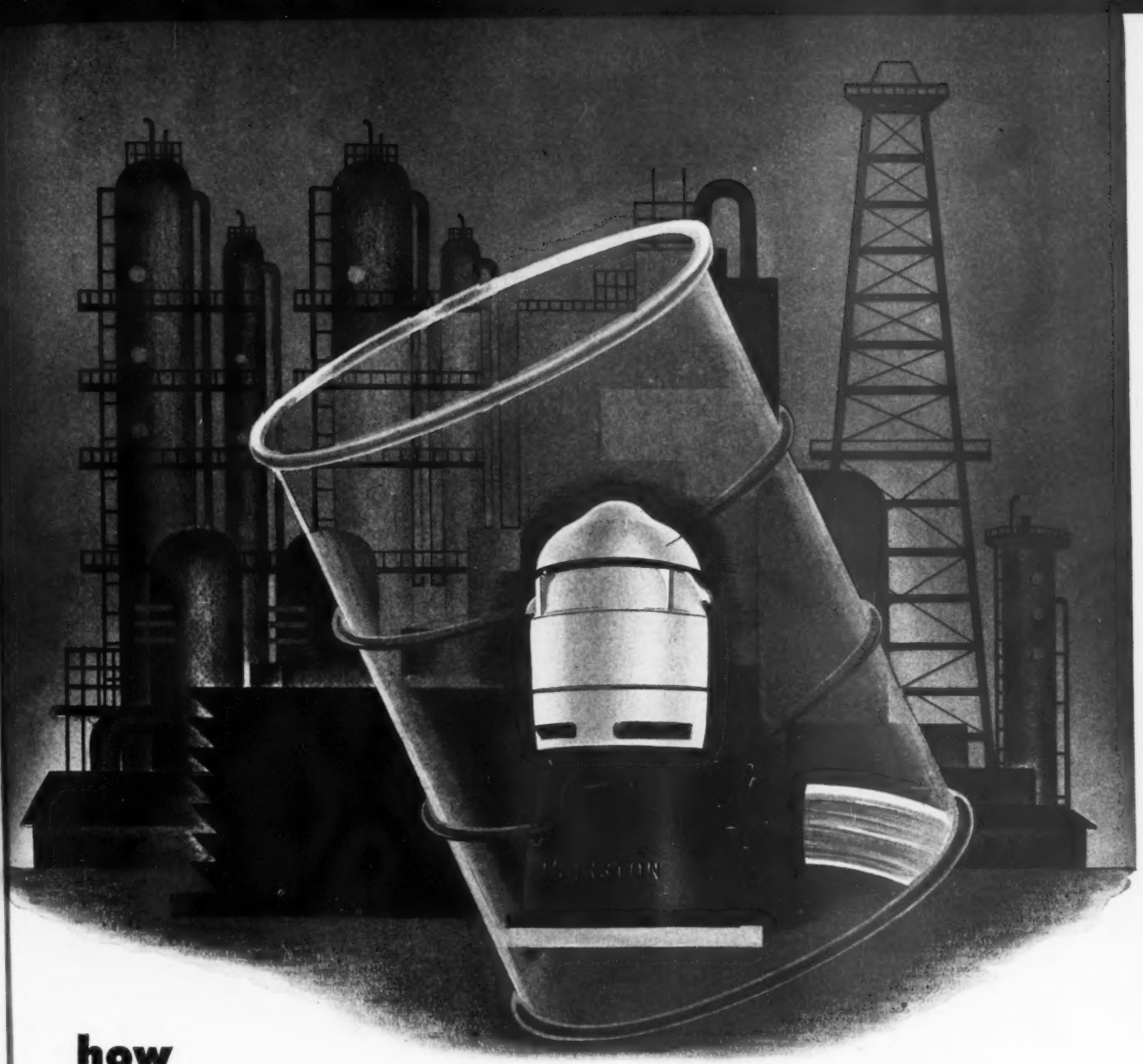
Mass builders have run into growing difficulty in selling houses in their big projects. January was very good but a downturn started in March. Now attendance at opening of a new tract usually is small and visitors look, but they do not buy. Many of them no longer have enough savings on hand to make a down payment as low as $500 to $750. Even veterans who are offered homes with nothing down are unable to qualify for the financing required, either because their wages do not justify the monthly payment of $55 to $65. or because they also have collateral obligations such as car payments or installment loans on furniture.

One large operator said that whereas it has been common to sell out a tract of 500 to 1,000 homes in a month or less, his salesmen now have to interview about 200 prospects to get one signed on the dotted line.

The situation is reflected in a softening of the labor market. A tract builder advertised recently for skilled carpenters, and 1,500 applied for work. The hiring halls, which formerly have had eight to a dozen workers available, now have 300 or more on call—men with good experience and ability.

Unemployment Checked

Meanwhile, employment is not dropping as rapidly in the commercial, industrial, and construction categories. Engineering awards in the southwest have risen sharply this spring. Money set aside for public construction is gradually being thawed out and put into circulation.



how much WATER in a barrel of oil?

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Nevada Sees a Good Thing And Passes Law to Promote It

New legislation makes property stored in transit free from personal property tax; California shipbuilding picture fades.

SAN FRANCISCO—Nevada's new law making property stored in transit free from personal property tax, which conceivably may result in Reno and Las Vegas becoming important distribution points for freight moving into and out of northern and southern California, is one indication of how business may endeavor to burst the tightening bonds of taxation imposed by ever-enlarging governments, federal, state, county and municipal.

All personal property in California is subject to personal property tax as of the first Monday in March, with the result that business firms endeavor as far as possible to delay receiving shipments until after that date and to expedite outgoing merchandise so that it will be elsewhere before the first Monday. While this tends to empty warehouses somewhat, personal property taxes in other states cannot be escaped, but now Nevada has provided a tax-less "inland free port."

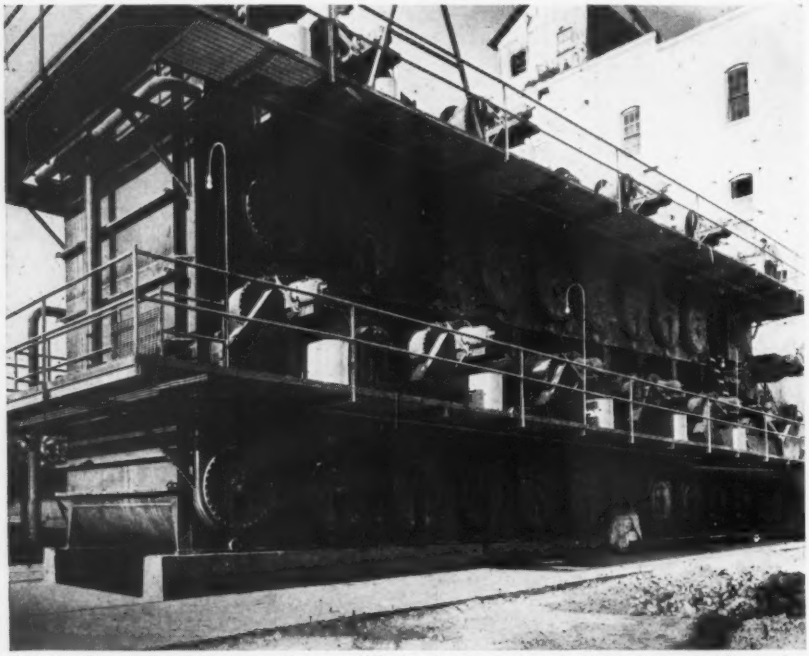
Any property, goods, wares or merchandise consigned to a warehouse within the state of Nevada from outside the state, for storage or assembly in transit to a final destination, whether specified when transportation begins or afterwards, is exempt from local taxation.

The law grew out of inquiries received by E. S. Bender of the Bender Warehouse Company, Reno, from canned fruit and vegetable packers in California as to the availability of storage facilities in that city. When it was learned that they were interested in lowering the delivered cost of their merchandise, Nevada people saw the possibilities ahead for their state. Although the Canners League of California standard contract provides that taxes on canned goods still in California on that date must be paid by the buyer, which lets the canner off the hook, the tax tends to reduce consumption.

By using Nevada as an assembly point to consolidate carloads, eastbound shippers could gain additional advantage.

On westbound shipments there have been immediate effects since the law was passed earlier in the spring. The Muncie Gear Works of Muncie, Indiana, shipped 500 outboard motors to Reno, where they can await distribution to buyers without fear of tax, and 6,000 electric washing machines from Chicago Electric Manufacturing Co. were in storage in Reno at the time the law was passed. Beaver Tractor Co. of Stamford, Conn., are reported to be studying a plan to set up a Western distrition point in Nevada. Among the inquiries received by the Reno Chamber of Commerce, which has a descriptive folder available on request, are those from Schenley Distillieries, American Factors, Ltd., Export Packers, Ltd. of Los Angeles, West Los Angeles Milling Co. and Nassau Chemical Co.

California Manufacturers Association are making good headway in their fight to prevent further increases in industrial gas rates, and at the present writing it seems likely that industry will not need to fear having its cost structure disturbed on this score.



• Union Sugar Company's continuous diffusion battery, the most modern machinery for sugar extraction, has increased the capacity of their Betteravia plant by 25 per cent.

Public Utilities Hearing

In the hearing before the Public Utilities Commission on the current Pacific Gas & Electric Company petition for increased rates, they have been able to show by the company's own figures that since 1946 its revenue from surplus and interruptible gas has increased $8,037,709, and from firm industrial $522,424, while general service customers have paid only a total of $2,878,581 more than they did three years ago. In the same period operating expenses of the gas department have increased $1,833,868 and net revenue $8,418,771.

Assurance is also given by the research department of the California State Chamber of Commerce that natural gas will continue to be available at rates below those of any other industrial areas of the country

(Continued on Page 56)

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with Elevating Endgate

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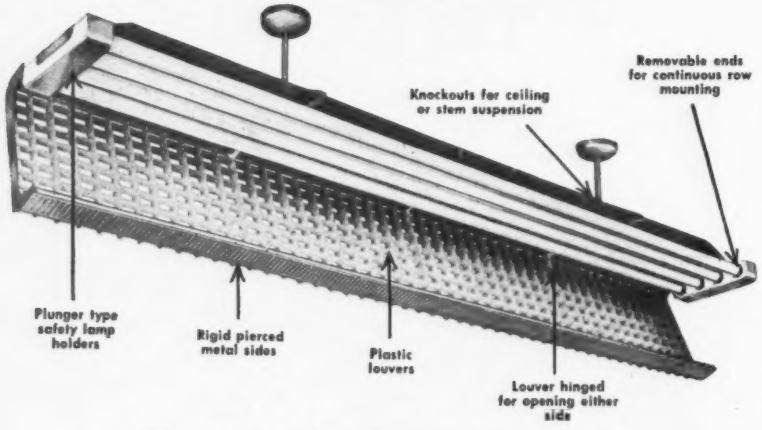
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S. F. REGIONAL

(Continued from Page 54)

other than those adjoining natural gas fields. Recent average costs to utilities buying from producers in California have been 10c to 11c per thousand cubic feet, it is stated, while gas imported to southern California will cost them about 14c and that brought a greater distance to northern California 19c to 20c.

Power Costs

Favorable electric power costs are also reported by Herbert Ormsby, research director, analysis of published schedules showing costs to large users in largest cities ranging from 6.8 mills to 8.7 mills per kilowatt-hour in Los Angeles County and 8.7 mills in the San Francisco Bay area. By comparison, the figures show Chicago with 9.9 mills, 10.0 mills in Pittsburgh, Boston 13.3, New York 13.5 and Detroit 14.3 mills.

Many journalistic descriptions of localized water problems, where communities are having to develop new supplies for expanding population, according to Mr. Ormsby, have given a greatly distorted impression both as to their actual nature and their magnitude. In northern California, he points out, water needs for many decades will be provided for by the $400,000,000 Central Valley Project and a related series of flood control and water conservation dams. In southern California, it is estimated that an additional 5,000,000 population and 500,000 acres of agricultural land can be served from the Colorado River, if California's legal rights to its full share of the river flow are established.

Space Sought

The problem of storing the largest cotton crop in California history has been engaging much attention in the San Francisco Bay area, and various efforts are being made to find suitable warehouse space. Cotton requires much more fire protection than other products, so the problem is not too easy of solution. An interesting angle in the situation is that the International Longshoremen's & Warehousemen's union, Harry Bridges' group, who promised when the maritime strike ended last December to cooperate with shipowners in retaining and increasing shipping, have engaged an industrial engineer to find storage space.

Greased Too Well

A few weeks back it appeared certain that the way was greased for the proposed twin bridge across San Francisco Bay, paralleling the present structure, to be accepted by all authorities and construction completed by 1954. The San Francisco Chamber of Commerce, leading exponent of a southern crossing, had reversed its posi-

tion, the San Francisco Bay Area Council had followed in line for the twin bridge.

But now it appears there will be delay, if not a change in plans, as the result of hearings before a committee from the state legislature. Here the advocates of a crossing from south of Hunters Point on the San Francisco side to Alameda, which they assert could be built for $60,000,000, or one-third the cost of the parallel bridge, have had their inning. Also the proponents of the Reber Plan have given their arguments for a 2,000-foot wide earth and rock dam which would carry 32 lanes of motor traffic, plus rapid transit lines and steam railroads, and would also make the southern end of San Francisco Bay a fresh water lake. The Reber Plan also proposes making a second fresh water basin out if the northern portion of the bay by a second dam from Point Richmond to the Marin County shore.

Gone But Not Forgotten

Hopes of reviving shipbuilding activity on the West Coast are not very bright, in the view of Daniel D. Strohmeier, vice-president in charge of shipbuilding for Bethlehem Steel Company. On a recent visit to San Francisco he said the higher costs on the Coast resulting from higher wage scales and greater distance from raw materials are not equalized by the 6 per cent differential allowed in Maritime Commission contracts. Bethlehem had hoped to keep its West Coast yards busy by allocating some of the 32 tankers being built at Quincy, Mass., and Sparrows Point, Md., to its West Coast yards, but found the dimensions of the tankers were such that the ways at Alameda, San Francisco and San Pedro could not handle the jobs because of the width of beam.

A few figures at random of purchases by Westinghouse from Western suppliers in 1948 were given recently by B. W. Clark, vice-president in charge of sales, as follows:

Steel plate, 5,000,000 pounds.
Iron castings, 450,000 pounds.
Steel castings, 780,000 pounds.
Steel forgings, 54,000 pounds.
Steel sheet, 1,200,000 pounds.
Steel bars, 500,000 pounds.
Steel structural shapes, 300,000 pounds.

To pack and ship some of the products of the various Westinghouse plants in the West, particularly Sunnyvale, 890,000 board feet of Western lumber was used.

Business Administration School

Menlo School and College, Menlo Park, Calif., announce the establishment of a school of business administration, offering courses in the junior and senior years which will lead to the degree of bachelor of science in business administration, commencing September 12, 1949. James L. Brainerd is director of the new school.

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SOCKET HEAD SCREWS
made by the Kaufman Process
assure you Extra Values
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Northwest Still Hog Fuel Minded Despite Dwindling Supply

Oil continues to be the favored fuel; Transportation cost reduction may swing decision to coal; Hogged fuel still cheapest.

PACIFIC NORTHWEST—Out of the latest of various conferences on Pacific Northwest industrial fuel problems, a symposium in Portland on April 22 sponsored by the Raw Materials Survey in cooperation with the Oregon section of the American Institute of Mining and Metallurgical Engineers, may be gleaned the following facts of life:

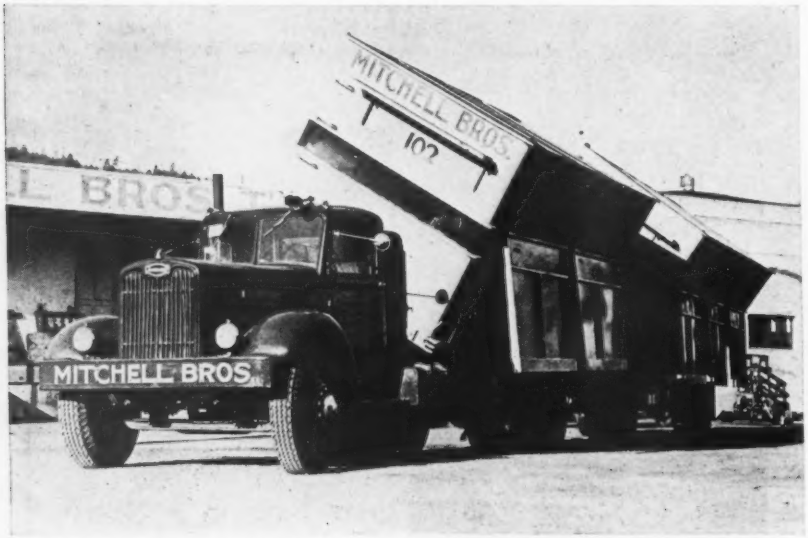
(1) Believe it or not, the Northwest still seems to be more or less "hogged fuel minded," despite the fact that wood now furnishes only 16 per cent of the total energy, and is getting scarcer every day.

(2) Until natural gas is delivered from Canada or the Rocky Mountain area, a prospect that may materialize in the "immediate future" (whatever that is), oil will continue to be the favored fuel, but—

(3) The cost differential between oil and coal appears to be within the brackets wherein a reduction in transportation costs would markedly influence decisions as to which fuel to use.

(4) For smaller power generating units, the power cost from stationary diesels is competitive, a matter of some importance as long as restrictions upon electrical energy are enforced because of shortage of supply.

Participants in the symposium, and the topics assigned to them were: James F. Bell, assistant to the president, Portland Gas & Coke Co., gas; Stephen A. Green, fuel consultant, coal; T. C. Wellman, assistant manager, gasoline and fuel oil division, Standard Oil of California, petroleum; Edward G. Locke, chief, forest utilization service, Pacific Northwest Forest and Range Experiment Station, wood; Paul D. Christerson, engineer, industries department, Portland Chamber of Commerce, steam and power; Ivan Bloch, industrial consultant, interrelation of Pacific Northwest sources of energy.



• Mitchell Bros. of Portland, Oregon, dissatisfied with existing equipment available to transport hog fuel, used some of that Western ingenuity to come up with this specially designed body (two of them are shown above) which fills the bill admirably.

Unhandy Source

Approximately one unit of "sawmill waste" in the form of hogged fuel is produced for every thousand feet of lumber cut, Mr. Locke reported, so the Douglas fir region's cut of nine billion feet of lumber in 1947 should have produced nine million units of hogged wood. But the movement of the sawmill industry southward from Puget Sound and the Columbia River to the last virgin stands of Douglas fir in southwestern Oregon has left much of this fuel supply out of the reach of the industrial centers.

Supply Dwindles

The supply also has been decreased by the advent of hydraulic barkers in pulp mills, which make an additional 20 per cent of the log available for pulp, the development of methods to convert wood by chemical means into other products and the growing installation of dry kilns to produce better and more uniform lumber. Most of the kilns are heated by steam produced from hogged wood, so the sawmills have less wood waste to sell. In one section of Washington were oil is selling for 8¾c a gallon, hogged fuel is selling competitively for $6.50 a unit, a far cry from the $1 a unit price prevailing before the war for hogged wood delivered on the grate at a central steam plant.

Comparative costs for the various fuels, given by Mr. Christerson, show hog fuel

(Continued on Page 60)

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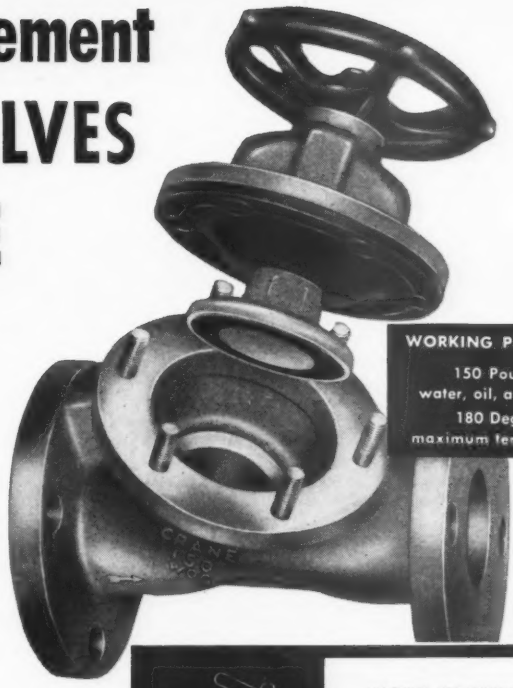

WORKING PRESSURE:
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water, oil, air or gas
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maximum temperature

Now, after completing exhaustive tests, Crane presents this better diaphragm valve—better suited for more services under today's working conditions. Stemming from basic improvements, such as the radically new bonnet-sealing and valve-seating arrangement, this original Crane design introduces many outstanding service features like those shown here.

1. LONGER DIAPHRAGM LIFE, because diaphragm is used *only* to seal the bonnet—not for seating purposes.

2. POSITIVE SHUT-OFF in case of diaphragm failure. This is an exclusive Crane safety feature.

3. ACCURATE SEATING—new flat face disc with durable, resilient seating surface assures tight closure on all fluids.

4. GREATER FLOW CAPACITY with reduced resistance and pressure drop, assured by Crane Y-pattern body design.

5. EASIER OPERATION—Crane separate disc and diaphragm construction takes less torque—fewer turns—to operate.

HOW IT WORKS

The Crane diaphragm serves one function only—sealing the bonnet. It is not subject to crushing and rapid wear. The seating member is a separate circular flat face disc, firmly attached to the stem and joined to the diaphragm with a special leakproof connection. This independent seating feature permits positive shut-off with no loss of fluid, even in case of diaphragm failure.

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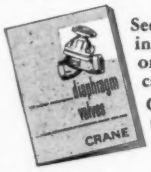

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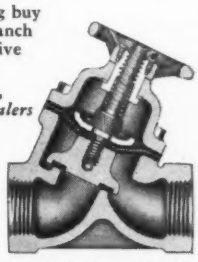
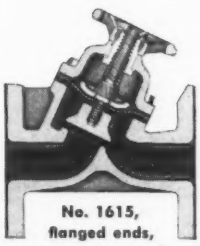
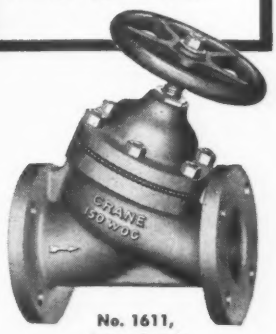
This new Crane line includes iron valves with screwed ends in sizes ½ to 2 in.; with flanged ends from ½ to 4 in. Neoprene coated valves—flanged ends only—in sizes from ½ to 4 in.



No. 1610, screwed ends



No. 1615, flanged ends, neoprene coated



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PACIFIC NORTHWEST REVIEW

(Continued from Page 58)

the cheapest of all, 14½c for 1,000 pounds of steam when the wood can be obtained for $1.50 a unit from an adjacent sawmill or other woodworking plant, and 29c when the wood is purchased for $3.50 a unit from other sources of supply. Utah coal at $10.30 a ton delivered gives a cost of 62c, and oil at $2.20 a barrel, 43c. Manufactured gas is completely out of the picture, with a cost of $1.60 for 1,000 pounds of steam.

Electricity Costs

Costs for producing power, per kilowatt hour, in mills, according to Mr. Christersen, on a basis of 50 per cent plant factor (ratio of actual net output to full capacity) and amortization period of eight years, may be figured as follows:

Fuel	Turbine, KW			
	2,000	4,000	10,000	25,000
Hogged fuel @$1.50	15.5	14.3	12.9	9.9
Hogged fuel @$3.50	17.6	16.3	14.6	11.5
Oil	19.9	18.5	16.5	13.1
Coal	21.4	19.9	17.7	14.3

His estimate of cost for producing power by diesel engines, with diesel oil at 10.7c a gallon was 17 mills per kilowatt-hour for a 500 kw. plant, 15 mills for 500 kw., 14.3 mills for 1,500 kw., and 13.8 for a 2,000 kw. plant.

Coal Costs

Utah coal (Carbon County), shows in the Green report as costing $10.30 a ton delivered, as against Washington coal available in Portland at $6.45, or 36c per million Btu's as against 40c for the Utah fuel, the latter's superiority in ash and moisture content however, and its excellent storage qualities compared to the Washington coal's poor storage quality, make the Utah product more desirable. For medium or medium-plus grades of coal, approximately 50 per cent of the delivered cost is in freight charges.

That the Pacific Northwest could absorb the output of a natural gas pipeline with a daily capacity of 200,000,000 cubic feet, was indicated by a market survey in 1948 in which Portland Gas & Coke participated, it was reported by Mr. Bell. On the basis of the experience of the country as a whole, 6 per cent of this supply would be used by industry, 16 per cent by domestic consumers and 6 per cent by commercial.

Power Expansion

A picture of electric power expansion was drawn by Mr. Bloch, who said that per capita utilization in the Pacific Northwest seems to be doubling every 5½ years, as against 6½ years for the country as a whole. He predicted that energy demands would continue to increase, because new plants in the region, having no initial obsolescence to overcome, would be highly

mechanized and start with most modern equipment. This would mean more individual motor drives, more electronic equipment for production, quality control and other purposes, more heat treating and baking.

Steam Generation

He also forecast the possibility, if development of the Columbia Valley makes available substantial blocks of very low cost power, of future major uses of electric power to generate steam, basing his opinion on the experience of eastern Canada, Switzerland and Scandinavia. He suggested individual small capacity electric boilers, endowed with remarkable flexibility and ease of operation, as conceivably supplanting central steam supplies in certain industries. He figured electric power at 1.8 mill per kilowatt hour as about equivalent to $10 per ton coal in terms of heating value, and 1 mill power to $1.65 per barrel Bunker C grade oil.

The trend in the lumber industry toward kiln drying is indicated by the fact that the entire two-day annual meeting of the Northwest Wood Products Clinic at Spokane in April was devoted to this topic. The big problem evidently is to provide installations that will enable the small lumber operator to meeting market standards without excessive investment. This is not necessarily easy, in view of the fact that as much as a ton of water may have to be removed from each thousand feet of lumber. The trend, as reported by Joseph I. Steele of Moore Dry Kiln Co., Portland, is toward faster air circulation and lower temperatures, better insulation in severe climates and closer control of temperatures and humidity to eliminate case hardening, warping and de-grade.

Stream Pollution

Oregon's state sanitary authority is on the warpath regarding stream pollution, and has given the cities of Albany, Corvallis, Oswego, Sheridan, Springfield and Toledo 60 days in which to submit specific time schedules for constructing and financing sewage treatment systems. Most of the sewage problems apparently will be solved by about 1952, the date fixed for completion of Portland's disposal plant.

Chairman Harold Wendel of the authority warned at a hearing on April 27 that time was rapidly approaching when a court test must be made of laws relating to pollution by industry. Nils Teren of Oregon Pulp & Paper Co. termed the Weyerhaeuser magnesium base process being used at Longview to dispose of sulphite waste liquors as being in the experimental stage and tremendously expensive. Frank Youngman of Crown-Zellerbach reported that his company is carrying on experiments to determine whether burning paper mill waste is practical, and shortly will know whether a full scale pilot plant costing from $300,000 to $400,000 would be practical.

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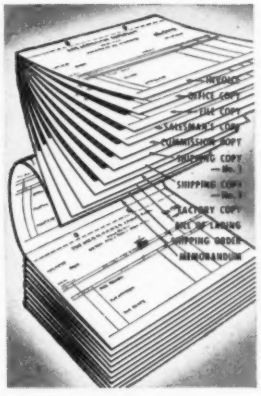

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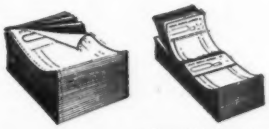

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Big Denver Construction Projects Spell Lush Times for the State

World's deepest well a Wyoming accomplishment; Colorado expects heavy tourist and crop season; Real estate market upset

DENVER—"So many big construction jobs are getting under way that we just don't have men enough to to take off the lists and give cost estimates."

This remark by one of the mountain states area's leading lumber and millwork executives shows what is happening in one of the major industries. Both public and private construction, particularly in the large and middle-size classifications, is in a very lush period and getting more so week by week.

This estimate covers undertakings that have reached the material-supplying stage. Such huge by-and-by projects as the Arco atomic energy development in Idaho, and Denver's enormous Veterans hospital aren't included.

Costs are softening a little, but not much. In Denver the union painters just scored a gain of a few cents per hour, and other crafts seem at least able to hold their own. On the other hand, most contractors now appear to feel that they can bank on today's costs with confidence, with the likelihood that they will not only be safe on cost estimates or bids but may be able to pass along a modest saving before work actually is completed.

World's Deepest Well

A California oil operator has astounded the world by putting down three wells far deeper than man ever has penetrated into the earth's brittle crust. Not just one record-shattering well, but another and then another. Now the record stands at just a shade under 20,000 feet below the surface and the record-breaker is in southwestern Wyoming on the old Oregon Trail between Lander and Rock Springs.

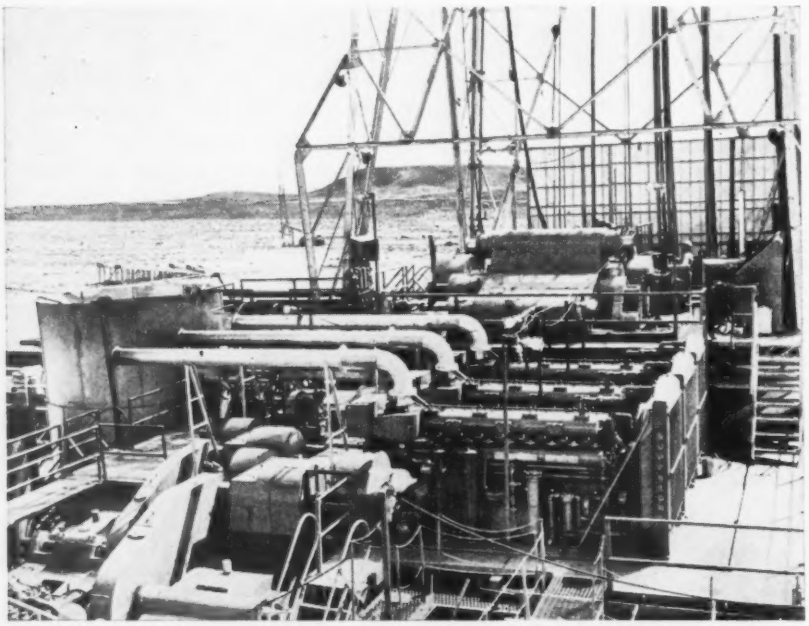
Superior Oil Company claims it puts down its deep holes just to locate new oil fields. Whether Superior's Pacific Creek wildcat in Wyoming will produce oil or not is anybody's guess. The former champion depth holder was a California well and before that it was one in Oklahoma—all Superior Oil operations—and the Oklahoma and California tests wound up as dry holes with the cryptic epitaph: "plugged and abandoned."

William Keck, Jr., is the man who said, "Oh yeah?" when National Supply Co. proclaimed its new million-dollar drilling rig capable of drilling to the unheard-of depth of 20,000 feet. Keck is one of six vice presidents of Superior Oil Co., and a drilling fool if ever there was one. His company is so very profitable to the stockholders (the Keck family owns more than half of the outstanding stock) that a few millions invested (or lost) in wildcat wells won't be missed.

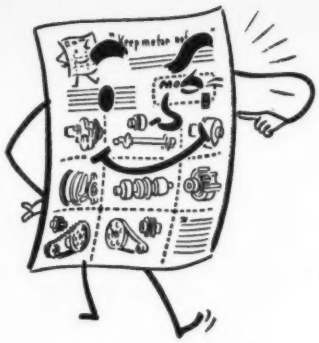
There is always a chance of bringing in a bonanza like the one discovered at about 13,000 feet at nearby Church Butte, Wyoming. In that operation (on the old Mormon Trail, not far from Salt Lake City) Mountain Fuel Supply Company and the Union Pacific railroad opened up one of the greatest natural gas fields of the nation in a place where gas is urgently needed. The Church Butte wells also produce vast quantities of practically straight gasoline (distillate) from a reserve that almost defies description.

Deep drilling is an exciting game and a costly one, but it has its rewards.

(Continued on Page 64)



• Looking toward the derrick floor at Superior Oil Company's Pacific Creek No. 1 wildcat well, in southwestern Wyoming. In the foreground are three Superior supercharged dual-fuel diesels which develop a combined 2010 horsepower to operate this giant rig, claimed by Superior to be the largest diesel power rig ever put into such use.



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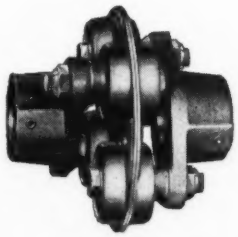
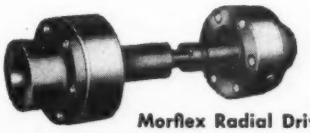
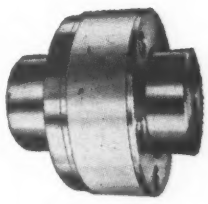


Morflex Couplings

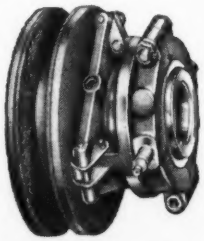


Morflex Radial Drive Shafts

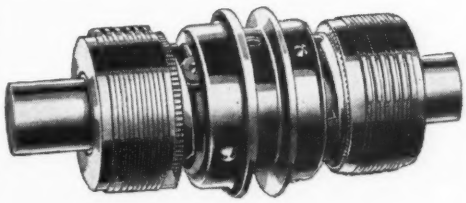
Morflex Drive Shafts



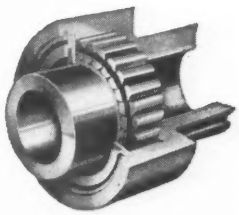
Morflex Radial Couplings



Morse-Rockford Over-Center Friction Clutches

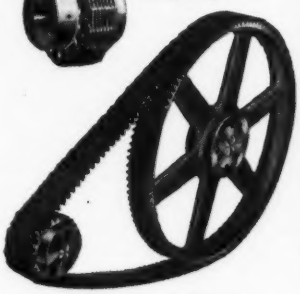


Morse-Rockford Pullmore Clutches



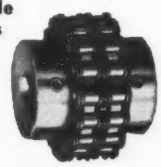
Morse-Formsprag Over-Running Clutches

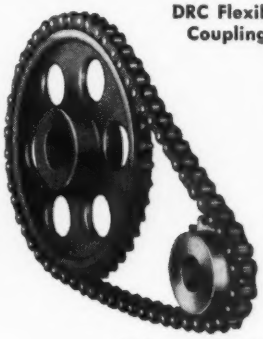
DSC Flexible Couplings



Silent Chain Drives

DRC Flexible Couplings





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DENVER REVIEW

(Continued from Page 62)

Biggest gripe of the Keck tribe is that people and the press seem to be interested in their newsworthy holes in the ground. The Keck's hate publicity so fervently that they bulldoze everyone associated with their enterprises — even as vendors of equipment and supplies — into solemn pledges of secrecy. Try to keep it a secret that you've explored a new world, closed to the earth's core than man ever dared to penetrate before. Any Keck will tell you it's a heck of a job.

Tourists and Crops

Just when it looked as if the inflationary pressure had eased up for sure and everybody was going to have to worry about cutbacks and unemployment, the American public and Mother Nature upset the applecart again. This time it is good news and everybody is glad. It all goes to show that nobody can predict anything any more.

Another record-breaking tourist season is under way in the West. People have money to spend and they are spending it. Cannily, making sure they're getting a bargain every time—but the money is changing hands. They are buying things that will need to be replaced on the merchants' shelves, which will mean starting up the production lines again.

Just when the tourist season in the mountain states begins to taper off, the harvest season will be reaching its main strength. And harvest season means money in the jeans of farmers, stockmen and everybody living in the rural areas.

The best business season of the year comes when farmers and stockmen come to town in the fall to pay up their bills, pay off their loans at the bank, stock up on anything they didn't feel quite flush enough to buy before, and take off for New York, Florida or California for a well-earned vacation.

Old Man Depression won't be at home this season, after all.

Restlessness in Denver

Uneasy lies the head that wears a crown, and the Queen City of the Plains is tossing fitfully in its sleep as if having bad dreams. It seems that the old argument as to whether Denver ought to attract more industrial payrolls is getting to the bitter stage. Now the real estate men are getting into the argument, which used to be confined to a few fresh-water commentators and left-wing politicians.

The real estate men are actually conducting classes to indoctrinate their members with The Truth About Denver, meaning what ails the Chamber of Commerce and why doesn't Denver get all the nice industrial plants that are moving to Pueblo, Colorado Springs, Boulder and other smaller cities in the mountain states?

Anybody who sells real estate will tell you Denver is in a bad way. Real estate prices are toppling, although Denver is so short of housing the people are hanging out the windows, living in damp basements, trailers, jerry-built shacks and worse. Prices on older homes in the Capitol Hill area have dropped off 25% or more in the past ten years and the slide is developing with greater gusto.

Yet the great number of new apartment units is being increased month by month and *the apartments are not being taken.* Prices are outlandish and people just aren't accepting such offers. So there is many a half-empty apartment house in a city suffering from an acute housing shortage—because people's can't or won't pay the fancy prices the owners of new apartments say they must collect in order to come out on their heavy investments.

Not only is the apartment situation goofy. Wait until a few more hastily-built "veterans housing developments" complete the havoc. Thousands of badly built, uncomfortable and tiresome looking little houses, hurriedly built toward the end of the war and since, have been sold to nice young couples at ridiculously high prices.

Now the houses are beginning to come apart at the seams, while the owner's equity hasn't even started to amount to anything at all. In many instances the loan today is far higher than the actual selling price the house would bring, because values of such property have skidded so much faster than long-term loans can be amortized. This is the sort of situation that breeds rebellion and grief. Now we understand why real estate men are restive. The only antidote they see is a lot more industry in Denver—quick.

The real estate men won't listen to the logic that industrial development in the hinterland around Denver means more business for Denver and more prosperity for Denver's residents. They want smokestacks and payrolls. They want the new Triplex piston plant in Denver, not in Pueblo. They are burned up that Denver didn't get Nestle's chocolate business, rather than seeing it land in Colorado Springs. They want . . .

What they want is new leadership in Denver and a wholly different attitude toward industries looking for new homes. To the old-line barons of Denver's industry and finance, and even to the younger men whose big regional businesses are doing fine, the excited clamor of the worried real estate men is a lot of chatter that can be ignored or at least given little notice.

Knowing that business in Denver is good and that the town is growing as fast as it possibly can stand it, these sages refuse to be alarmed. They know that Denver's prosperity is geared to that of the whole region and feeds on the industries of Pueblo, Cheyenne, Casper, Colorado Springs and all the other little cities of the area.

Serenely they contemplate Denver's postwar growing pains, sure that Denver will muddle through in its unspectacular way, always a little bigger and a little stronger in its hold on the Rocky Mountain region. Those of a literary inclination find the situation faintly reminiscent of a scene in the operetta, "The King's Henchman," by Edna St. Vincent Millay. A group of rough soldiers were tormenting a bishop, giving him and his beliefs a rather bad time of it. At last he spoke, very softly:

"Blow on. The church of God is not a candle."

Research Dream Fades

Many moons ago Colorado proclaimed itself interested in industrial development. Two hundred of the states leading citizens were recruited into The Governor's Committee, and this body evolved into the Colorado Resources Development Council. Areas of work were blocked out and dozens of industrial development projects were listed as worthy of attention. A staff was hired and millions of words of explanation, promises and appeals for support were published. Gradually everything else seemed to be lost in the shuffle except the appeals for support, and the staff.

Just where the train went off the track isn't easy to chart. Different observers will have different views on that. This one, who joined hopefully in the venture from the start would offer his views about as follows:

The determination to have the enterprise entirely independent of the state government and financed entirely by private industry isn't in keeping with the views of the majority of the industrialists and probably won't work. It would be more likely to work if the state legislature were to establish the council as one unit in a comprehensive development program, with the state planning commission and the state publicity bureau functioning as other essential parts of the same development program.

Experience and Judgment

Most important, the experience and judgment of the leaders of the state's principal industries should be utilized in the venture—Anybody that can figure this out is better than I am.—H.W.

Unfortunately, these men now are rounded up periodically, given a sales talk about the value of the CRDC, asked to sign a pledge underwriting their share of its cost, and made "a committee of one" to solicit money from others in their industry. Nobody asks them to say anything or to think, or to plan. That, presumably, will be done by the paid staff, which devotes most of its time to the task of perpetuating itself.

Sound familiar? Too true. The CRDC enterprise isn't washed up, as yet. It is eminently worth saving, and some of the industrialists may find a way to wrest it from the braintrusters and re-direct it to its great purpose.

Wage Incentive Systems

IT'S GOOD business to put the employee in business for himself, right at his regular job, Vice-President Carl W. Coslow of Plomb Tool Co. told 100 industrial engineers and executives at the Second Wage Incentive Institute of the Los Angeles Chamber of Commerce.

Coslow said wage incentive systems are good business because:

1. They save money, sometimes as much as 15 per cent on production costs, through increased output.

2. They attract top-calibre employees and discourage the dawdler.

3. They provide employees with higher living standards, through increased income, and longer employment opportunities in old age.

Companies operating incentive plans ordinarily set a base pay rate lower than in nonincentive shops, Coslow explained. Base rates are determined only after careful time-and-motion studies and calculations which are the specialty of the industrial engineer.

Even at the lower base, skilled workers can earn larger pay checks than men at nonincentive plants by producing in excess of the standard rate established for the base wage.

Thus, Coslow continued, the employee who lacks the skill to produce in excess of the standard can be expected to be dissatisfied with only the base rate. Consequently, he probably will seek a job at the higher prevailing rate in a nonincentive shop.

Conversely, the skilled worker will be dissatisfied with a prevailing scale when he learns that his capabilities can earn him more money under an incentive plan.

Coslow pointed out that, as a worker becomes less productive with age, he can continue to hold down a job at an incentive plant, albeit at lower income, as long as he meets the lower production standard. In a nonincentive shop, it could be expected, he said, that a worker would be dismissed when he becomes inefficient by the higher production standard.

Coslow offered 10 points for consideration by executives contemplating installation of incentive systems:

1. Evaluate what a 15 per cent saving in labor production cost may be worth.

2. Figure that administration of an incentive plan will cost from 2 to 5 per cent.

3. Pick experts to run time studies.

4. Study all operations, set standards and check results; delay paying extra until the incentive formula has proved itself. (A cutback due to miscalculation may upset morale and wreck the plan before it has a fair chance.)

5. Decide on processes to be covered by incentive pay; all operations are not adaptable; plan to cover as many as possible in due time.

6. Start the plan only in one department; when it succeeds, other departments will clamor for a chance for extra pay.

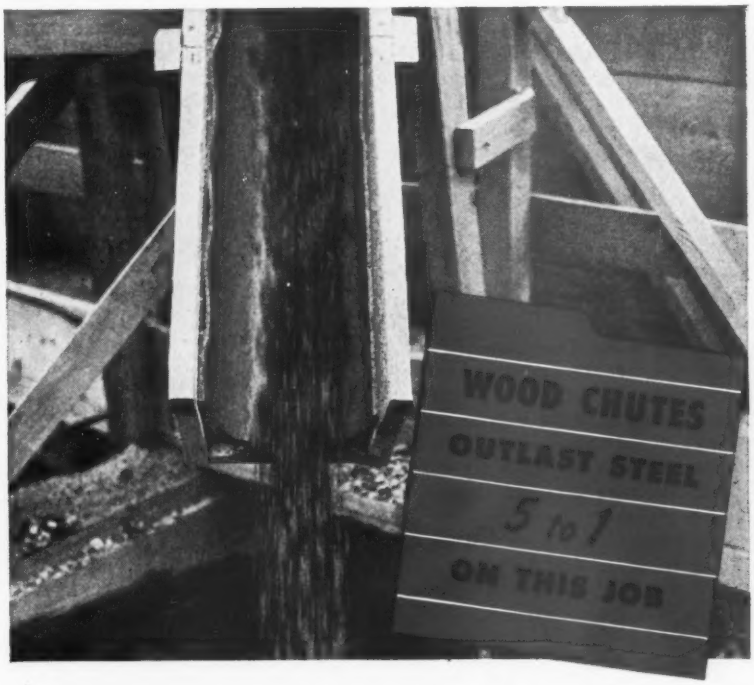
7. Keep employees and union representatives fully advised of all details at all times; don't shroud the formula in mystery.

8. Keep bonus earnings confidential; don't publish how much each worker earned for himself.

9. Establish an effective methods improvement department, or assign an improvement expert, to hunt constantly for avenues to better efficiency resulting from individuals' efforts to boost their own production.

10. Write a contract with unions, if any are involved, spelling out "the ground rules under which you'll play."

Coslow described incentives as "elementary to the American way of life."



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Influx of New Industries Makes for Robust Economic Health

Steel, oil, and refining industries added to non-ferrous metals to broaden economic base; Public spending to be conservative

SALT LAKE CITY—With general retail trade running only about three per cent behind last year, the Wasatch front area is still in robust economic health. Had it not been for the Kennecott Copper Corp. strike, which carried over into this year, it is doubtful if business would be below the first quarter of 1948. This dispute idled more than 5,000 workers for a hundred days and the depressive impact was concentrated wholly in the Salt Lake trade area.

Economic Transition

There are, of course, apprehensions and misgivings about the future, notwithstanding the encouraging indices. Experience has taught intermountain business and industry that a downturn (or an upturn) on the coasts is bound to catch up with this section in time. But there are some good reasons to believe that any national readjustment will be tempered in this locality by economic blood infusions from new industrial enterprises.

During the last few decades the Wasatch front's economic well-being was based primarily upon a static or declining industry-nonferrous metal mining and smelting. The major mining operations have, and are still holding up well but the number of small profitable mines has been diminishing. But during the past several years the base has been broadened by the addition of expanding industries, such as steel, oil refining, and various refining and fabricating enterprises. In other words the broad outlook is for growth rather than deterioration. And that situation is being reflected almost daily by announcements of new capital investment projects.

No Question Now

There is no longer any question but what the area has commercial oil fields. The only questions are how many and how big. Ashley valley in the Uintah basin now has nine producing wells and a score or more are scheduled for drilling this year. The San Juan basin is also a demonstrated oil and gas producer. Exploratory work is being pressed over a large part of the state.

Utah Oil Refining Company is contemplating the construction of a pipeline to the Ashley valley field and Standard of California dedicated its recently completed $15,000,000 refinery and Rangely pipeline by announcing plans for an immediate $10,000,000 expansion program at its North Salt Lake plant.

Kennecott Copper Corp. is ahead of schedule on its $16,000,000 copper refinery, which is expected to begin operations in mid-1950. And work is getting under way on a $3,500,000 plant to convert blister copper into anodes for the refinery. This latter is a joint enterprise of Kennecott and American Smelting & Refining Company.

Pacific States Cast Iron Pipe Company has gotten its new $3,500,000 "Super De Lavaud" pipe casting plant at Ironton into operation. While it will not increase employment by any substantial number, it will increase the company's productive capacity by about four times.

Industrial New Look

In addition to these major projects, which receive most of the public attention, there are numerous smaller business and industrial enterprises being fitted into the area's economic base. A specific example of this is furnished by the development of the wartime small arms ammunition plant in the western part of Salt Lake City.

Several months ago a small group of local investors decided that this $35,000,000 war surplus plant could be converted to peacetime uses. They purchased it from the government and began looking for tenants. They had 1,400,000 feet of floor space to dispose of, and at present all but 40,000 feet (which is not on trackage) and 9,000 feet on trackage has been leased for manufacturing, warehousing and distributive purposes.

As Gus P. Backman, executive secretary of the Salt Lake Chamber of Commerce expressed it:

"As long as we can keep getting industrial projects at $10,000,000 or so apiece, I don't see how we can have a depression around here."

Southeastern Idaho is, of course, flushed with economic excitement over the location of the atomic power experimental plant in that area. Projected to cost in the neighborhood of half a billion dollars, it is intoxicating medicine for an area which before the war was accustomed to thinking in terms of a few hundred thousand or a few million dollars. Just what this will amount to in the long run is dependent upon the success of the experiment. But it will certainly provide a stimulant for the next few years.

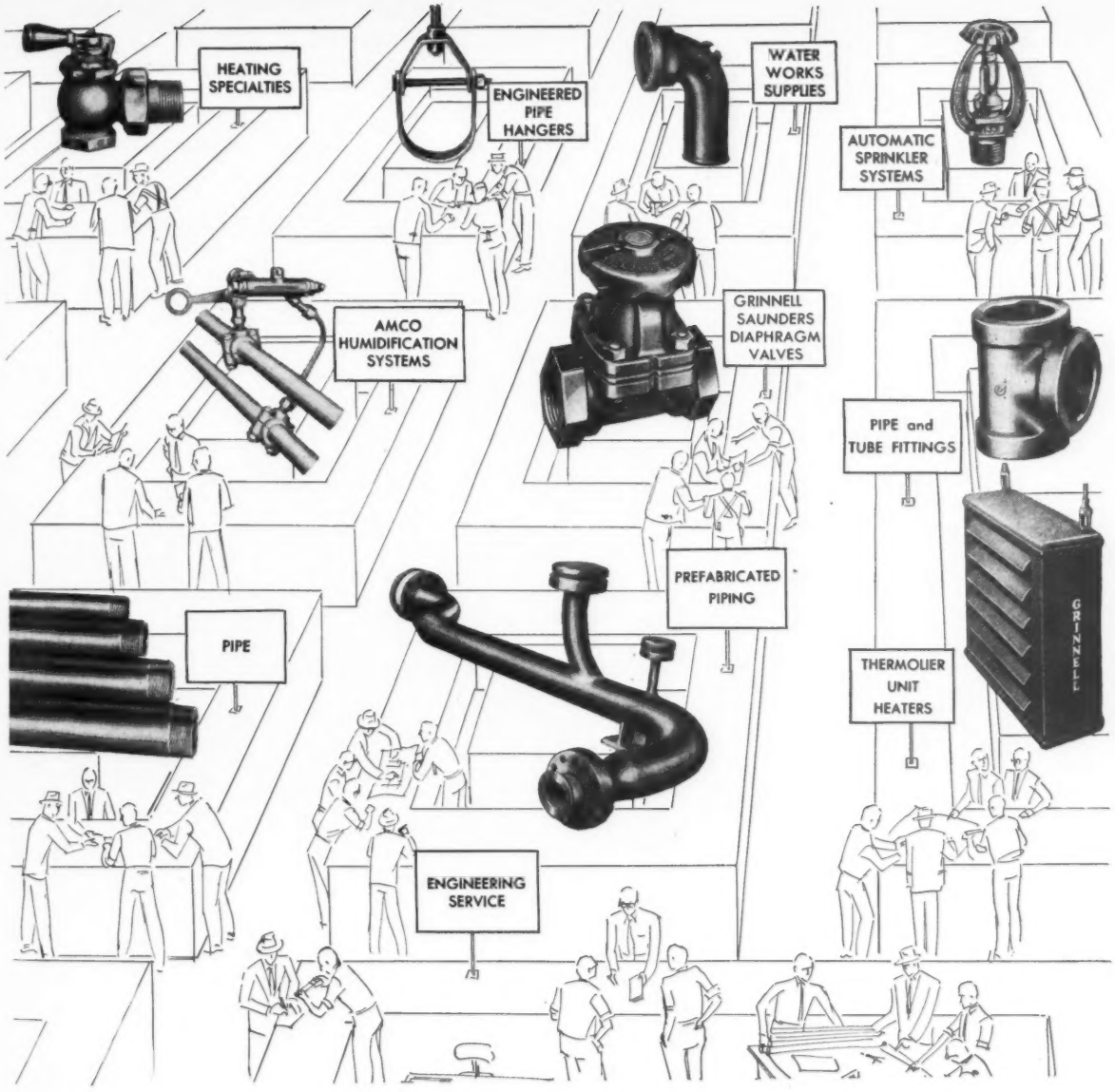
Civic Improvements

The Wasatch front has a direct interest in the project for that section of Idaho is in its trade area.

Because of depression and war deferred public improvements, Salt Lake City and other Utah communities now find themselves in rather frayed civic garb. Streets are in disrepair, there is a decided shortage of properly located school buildings and few civic improvements have been added in two decades, other than the ones the government financed in the WPA days of the depression. This has set up a clamor for more tax revenues. But Utah's new governor—J. Bracken Lee—thinks there is a more insistent, though less noisy demand, for curtailment of government expenditures and he is sitting tightly on the state lid. And his example is making city and county officials wary about pushing in the opposite direction. So the outlook for the near-term future, at least, is a conservative policy in public spending.

Utilities Improvement

The utilities are likewise under the necessity of expanding rapidly to meet present and anticipated demands. And two of them—Utah Power & Light Company and Mountain States Telephone & Telegraph Company—are currently seeking rate increases on the grounds that they cannot finance required improvements and extensions unless their securities are made more attractive to investors.



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947-M

Sliced, Cubed Foods Packed in Cans

Sliced or cubed fruits and vegetables and granular products are successfully fed into cans on a new machine which turns out from 61 to 168 filled cans per minute. The machine operates with Nos. 2½, 2, 303, or 1 Tall standard size cans, and one of its special features is the No-Can-No-Fill device which automatically prevents discharge of the product whenever a can is not at the receiving end of a discharge pocket. The machine is made by Food Machinery and Chemical Corporation, San Jose, Calif.

948-M

Lubricating Oil Testing Kit

New oil-testing kit put out by the Gerin Corporation, Red Bank, New Jersey, is especially designed for use by mechanics and engine attendants in garages, power plants, and railroads. The kit, which is portable, measures (1) change in viscosity, (2) amount of asphaltic and other oil breakdown substances, (3) amount of dirt, metal particles, other solids, and water, (4) acidity, showing whether corrosion is possible. Manufacturers point out that the unusual feature of this new product is the accuracy of results obtained by relatively unskilled employees.

949-M

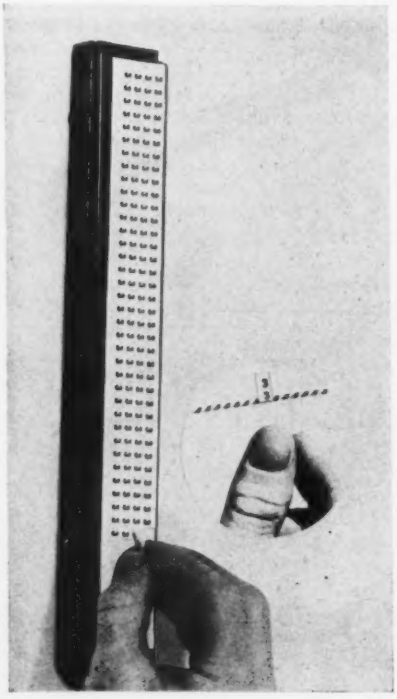
Low-Cost Wetting Agent

Designed for wet processing of textiles and other applications where surface tension reduction and quick wetting is desired is a new liquid wetting agent called Santomerse 30-X, put out by Monsanto Chemical Company, St. Louis, Missouri. It is a clear, extremely light-colored solution, and its makers say it has remarkable resistance to decomposition by either strong acids or alkalies, even under extreme conditions.

950-M

Numbered Tabs Identify Wires

For instant identification of different kinds of wire during manufacture of electrical units and wiring, the Flag-It wire marker has been invented. Flag-It markers measure ⅞ inches long and ⅜ inches wide, and come attached to 10-inch cards. When one of the numbered markers is slipped around a wire, it adheres to itself and stands up like a small signal flag to insure an instant identification of the wire. Made by Flag-It Wire Marker Co., Los Angeles, Calif.



951-M

New Instrument Measures Vibration

The laboratory of General Electric Company, Schenectady, New York, has developed a recording vibrometer which measures and records frequency, displacement and wave shape of mechanical vibration. The machine, which can be either mounted on a fixed base or held in the hands, weighs only seven pounds and is less than eight inches in length. It is designed for testing all types of reciprocating and rotating machinery within a vibration frequency range of 10 to 120 cycles per second, and records both steady-state and transient vibrations.

952-M

Heavy-Duty Stapler

A hand-operated stapler for heavy-duty use can be bolted in any convenient position to a bench, work table or packing table to staple together fibre-board, corrugated and other heavy materials. One of its outstanding features is its adaptability to use wide or extra wide staples in several leg lengths from ¼-inch to 9/16-inch, which makes possible the fastening by hand of many materials which ordinarily cannot be stapled with smaller machines. It is made by The Heller Company, Cleveland, Ohio.

953-M

Barrett Has Three New Elevators

Barrett-Cravens Co., Chicago, Ill., are now putting out three different types of hand-operated portable elevators, each suitable for a different type of job. The "5-Hundred" has an overall height of 6 ft. with 5 ft. lift, the "10-Hundred," an overall height of 8 ft. with lift of 6 ft. 4 inches and the "20-Hundred," their heavyweight model, has an overall height of 8 ft. with a lift of 5 ft. 8 inches. All three elevators have all-welded construction, cut spur gear reduction, caster steer and floor lock.

954-M

Chain Conveyor Runs Overhead

Chain-O-Flex is the name given to a new overhead conveyor made by Chain-O-Flex Corporation, Franklin Park, Ill. It consists of conveyor tube units containing chain connected to hooks, powered by a variable speed drive unit. The conveyor, say the manufacturers, can be quickly assembled and all parts bolted together like an erector set, and extremely long Chain-O-Flex systems may be powered by multiple drive units.

955-M

New Dust Hood Made of Plastic and Fabric

The new G-S Dust Hood is a loose-fitting fabric hood extending down to the shoulders, with a large plastic window cut out of the front for visibility. The hood, which is planned to protect the worker from irritating and nuisance dusts or sprays encountered when cleaning boilers, furnaces, chimneys, or paint spraying, may be worn with goggles or respirator. It is made by General Scientific Equipment Co., Philadelphia, Penna.

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956-M

New Industrial Truck Has 12-Foot Platform

The distinguishing feature of a new power industrial truck put out by *Elwell-Parker Electric Co., Cleveland, Ohio,* is its extra-low 12-foot long platform, designed for plants where it is desired to transport close to floor levels heavy loads of large surface area materials placed on skids, for safety and stability. The weight of the truck is 8,000 pounds, and its load-carrying capacity, 20,000 pounds.

957-M

Wood Adhesive Sets In 35 Minutes

Wood-Lok Q3022 is the name of a new high-speed wood adhesive which dries in from 15 to 35 minutes (depending on the wood specie and moisture content), thus eliminating need of suspending flow of production while adhesive dries. Wood-Lok Q3022, say the manufacturers, may be machined, sawed, or hammered after approximately a half-hour's setting time, and provides strong adhesion to such surfaces as Masonite and decorative laminates. It is made by National Adhesives, New York.

958-M

Grease and Oil Removed Through Vapor Method

Automatically controlled equipment for removal of grease and oil from metals through use of hot vapors is now being manufactured by Circo Products Company, Cleveland, Ohio. Solvent in the degreasing unit is heated, creating hot solvent vapor which penetrates greases and oils to bare metal parts being degreased, condensing on the colder metal, continuing to wash away soil until parts are completely degreased. Degreasing units come in a number of sizes, smallest of which stands 42½ inches high.

959-M

Three-Wheeled Hand Truck For Drums, Barrels

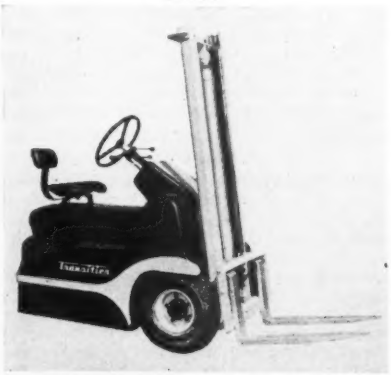
The Drumobile, made by Ernst Drumobile Division, Brantwood Products, Inc., Buffalo, N.Y., is a small three-wheeled hand truck which can pick up any type of barrel or drum, carry it in a level, upright position and deposit it gently without being touched by human hands and without tilting. It can handle loads up to 850 pounds in 50 to 60 gal. sizes. One of its most useful features is its ability to carry open containers, even when brim full, without danger of spilling, making for added safety in cases where hot liquids must be carried from one part of the plant to another.

960-M

Featherweight Fork Truck

A new lightweight electric fork truck, available in 1000- and 1500-pound capacity models, has been added to the Skylift series of the *Automatic Transportation Company, Chicago, Ill.* The new addition is distinguished for its lightness, low collapsed height of 78 inches and maneuverability and the fact that it can turn a complete circle in its own length, which is 51¼ inches plus the length of the forks.

961-M



New Transitier Truck Gasoline-Powered

New gasoline-powered fork lift truck being manufactured by Transitier Truck Company, Portland, Oregon, comes in 5-, 7-, and 9-foot lift heights, with an all-welded one-piece body frame construction of heavy gage steel stampings. An unusual feature of it is the Hydroflex clutch, which is operated hydraulically, and which is located above and behind the engine for easy accessibility. The truck is equipped with pneumatic tires.

962-M

New Sealant Salvages Rejected Metal Castings

A chemical sealant now on the market is designed for the economical salvaging of castings rejected due to porosity. 99 per cent of castings rejected because of leakage have been made usable after treatment under pressure with this sealant, say its makers. It is made by Western Sealant Company, Culver City, California, who are rendering impregnation service on a custom basis at their plant and also sell the sealant separately.

963-M

Automatic Tablet Bottling Machine

A new machine makes the packaging of tablets, coated and uncoated pills, and some capsules, a completely automatic operation. The machine, which comes in two models, delivers up to 120 filled containers per minute, and handles any count, odd or even, from 12 to 500, in rigid containers up to 3 inches in diameter and 7 inches in height. Used by one of the country's leading drug manufacturers, the machine is equipped with a bottle intake conveyor and delivery container to make packaging operations completely automatic, although hand feeding can be employed when desired. It is made by The U. S. Automatic Box Machinery Co. of Roslindale, Mass.

964-M

New Instrument Measures Oil Consistency

Preparation of varnish, linseed oil, dopes, and resins is an exacting job in which viscosity is all-important. A new viscosity controller and recorder, built by Westinghouse Electric Corp., Pittsburgh, Pa., for the Benolite Corporation, can make all measurements, record them, add solvent as needed, control temperatures, and even empty and fill the reactor vats if necessary. It also automatically records the viscosity on a circle-type graph. Use of this device is planned to release trained personnel for more important work.

965-M

Automatic Marking Machine Prints on Rods, Tubes, Bars

Welding rods, solder bars, short-length tubing and similar ferrous and non-ferrous products of ⅛-inch to 2-inch diameter can be printed automatically with the new motor-driven marking machines made by The Pannier Corporation, Pittsburgh, Pa. The machine handles uniform and irregular lengths from 2 inches to 24 inches. It prints continuously or intermittently as desired at 72 feet per minute. The machine weighs 220 pounds, is 44 inches long, 14 inches wide and 18 inches high.

966-M

Smaller Size Cutting Electrode for Small Shops

Welders with small AC welding machines who formerly were unable to do any large scale metal cutting will be glad to hear of the Cuttrode, a new cutting electrode only 3/32 inches in diameter, for cutting stainless, bronze, nickel, copper. It cuts thin sheet metals in seconds' time, using a guide or rule, thus making the cutting of metal possible to smaller shops that lacked the proper facilities before. It is made by Eutectic Welding Alloys Corporation, New York.

HELPFUL LITERATURE

for the plant operator who wants to keep informed

2550-L

"Eyes Right for the Job" describes the results of vision tests the optical firm, *Bausch & Lomb, Rochester, N. Y.,* made on industrial workers, through the use of the Ortho-Rater, a testing instrument which determines individual characteristics of vision of industrial workers, and thus aids in placing them in jobs for which they are visually qualified. The 18-page report includes case-histories showing how the program aided worker efficiency, reduced accidents, rejects and waste.

2551-L

Where to Buy Lumber—*West Coast Lumbermen's Association, Portland, Oregon,* has announced the publication of the January 1, 1949 edition of "Where To Buy," a directory issued twice yearly which lists alphabetically names and addresses of the Association's lumber manufacturers, along with the types of lumber they handle. The directory lists also companies going in for specialized services, such as timber fabricating and wood-treating, and is punched for loose-leaf binding.

2552-L

Your Cooling Tower I. Q.—*The Marley Company, Inc., Kansas City, Kansas,* who manufacture cooling towers and spray nozzles, have prepared a series of question-and-answer type folders under the heading of "What's Your Cooling Tower I. Q." The first in the series deals with water distribution, the second, air movement, the third, facts and figures. The booklets should make an interesting addition to the library of the plant engineer interested in water-cooling techniques.

2553-L

Data on Cold Extrusion of Steel—Extensive new data on the cold extrusion of steel is now available to the American public in a 138-page report recently released by the Office of Technical Services of the Department of Commerce.

2554-L

Electric Heater Catalog—A large comprehensive loose-leaf type catalog covering all types of electric heaters and their controls with tables of their ratings, prices, dimensions and instructions for installing them has just been issued by *Industrial Engineering & Equipment Co., St. Louis, Mo.*

2555-L

Ratchets Described—A new design in ratchets incorporating a smaller-type head for use in tight places and more teeth for more efficient ratcheting action is described in a new four-page brochure put out by *P&C Hand Forged Tool Company, Portland, Oregon.*

2556-L

"The Economies of Hardfacing," an eight-page reprint of an article which recently appeared in "The Welding Journal," reviews the advantages of hardfacing and offers an analysis of the problems leading to the correct selection of the proper hardfacing rods. The reprint, issued by *Air Reduction Pacific Company, San Francisco,* also contains design and cost figures, and has 14 photographic illustrations.

2557-L

"Your Guide to Safety in Woodworking Shops" is the thirty-third in a series of pocket-size safety booklets put out by the Accident Prevention Department of the *Association of Casualty and Surety Companies.* Included is information on proper care and use of hand tools and of woodworking machines, such as circular saws, jointers, drills, mortising machines, planers and lathes, and general safety advice for woodworking shops, such as proper ventilation, work clothing, lifting techniques, good plant housekeeping.

2558-L

Free Alloy Weight Calculator Offered—A small (3 inch) plastic sliderule-type calculator for determining the overall weight of various sheet and strip alloys in connection with stamping die practice is being offered free by *The Dayton Rogers Manufacturing Co., Minneapolis, Minnesota.* The calculator is designed to give the correct overall weight when the width of the strip, and the pitch of the part, or the number of pieces required per inch or foot are known, and can be used not only for steel, but also for aluminum, copper, bronze, lead, zinc, etc.

2559-L

Textiles, Leather and Other Organic Materials often deteriorate because of mildew and rot not only in the tropics but in many parts of the temperate zones. A summary of the information on this subject the *National Bureau of Standards* has accumulated in the past several years is presented in a new booklet, "Microbiological Deterioration of Organic Materials: Its Prevention and Methods of Test," now available from the *U. S. Government Printing Office.* The booklet classifies a wide variety of fungicides according to their effectiveness for diverse use, and rates plastics, plasticizers and related materials on their susceptibility to mold growth. 25 cents.

2560-L

A New Line of Trolley Hoists which are said by their manufacturers to possess the closest head room available in any hand hoist is described in a newly-available four-page catalog which contains photographs of the hoists, detailed dimension table and a precise description of each of the hoist's parts. *David Round & Son, Cleveland, Ohio.*

2561-L

"Modern Design for Instrument Panels & Cubicles" is the name of a new 12-page bulletin issued by *Falstrom Company, Passaic, N. J.* The bulletin contains helpful suggestions for streamlining of instrument panels, control boards, and electronic control cabinets with photographs of typical plant installations, diagrammed drawings and suggestions for the use of the different types of equipment the company manufacturers.

2562-L

Unusual Materials Handling Aids like skids and skidracks, pallets with unusually shaped bases and bridge plates(used to bridge the gap between platform and freight car) are shown in photographic form in a 16-page catalog put out by Fab-Weld Corporation, which should serve as an excellent addition to the plant's library of materials handling equipment.

2563-L

Boxes That Collapse, racks for holding metal coils, rack dollies and all types of pallet and stock racks are illustrated in a 12-page catalog full of drawings, specifications and suggested applications. *Equipment Mfg., Inc., Detroit, Mich.*

2564-L

Useful Data on Belting—Both conveyor and elevator types—is given in a new 24-page manual put out by *New York Belting & Packing Company, Passaic, N. J.* The manual includes data on carrying capacities, approximate belt weights, selection and application of elevator belts and the construction of all types of belts in the company's line.

2565-L

Maintenance of Plant Floors of all types, like wood, asphalt, rubber tile and linoleum and marble is covered in a new 34-page booklet just published by *Breuer Electric Manufacturing Co., Chicago, Ill.,* who make floor maintenance equipment. The booklet includes instructions for removing old finishes, bleaching, sanding, sealing, waxing and polishing and contains a stain removal chart.

2566-L

Gravity Conveyor Catalog—A new eight-page catalog describes the Rapid-Roller gravity conveyor, which is designed for economically moving materials with one strip of free-running surface, such as long strips of lumber, crates without sufficient flat surface to roll on wheels, long steel bars, cans with chimes, kegs, light drums and other materials. The catalog gives complete specifications of the conveyors, for both straight sections and curves. *The Rapids-Standard Co., Inc., Grand Rapids, Mich.*

2567-L

Government Checklist—A new 31-page checklist booklet listing new Government publications together with their prices and an order blank contains names of many which should be of great interest to industrial readers, such as the "Establishing and Operating Your Own Business Series," a group of 79 booklets, each explaining the operation of a different type of business, "Export and Import Practice," a "Chemical Statistics Directory" and many others. *Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.*

2568-L

Humidifier Bulletin—A new 12-page bulletin describing Armstrong steam humidifiers for automatically controlling relative humidity for prevention of dry air damage to hygroscopic materials such as paper, leather, wood, cork, foodstuffs, textiles and other materials in storage or in process, has been issued by *Armstrong Machine Works, Three Rivers, Mich.* Tables and charts are included on the desirable relative humidity in various industries and the installation, operation, selection and prices of eight models of the Armstrong humidifiers.

2569-L

Index to Nickeloid Metals—A handy "sampler" for selecting the proper type of pre-plated metal is available from *American Nickeloid Company, Peru, Illinois.* The sampler, a four-page letter-size folder, contains samples of Nickeloid metal finished in chrome, copper, nickel and brass—available on zinc, steel, copper, brass and aluminum bases. In addition to the actual samples in various finishes, complete data is given on sizes of sheets, coils and flat strips available.

READING GUIDE FOR WESTERN MANAGEMENT

A service for all management levels . . . current literature surveyed and appraised by the faculty of the School of Management, Golden Gate College

Your Public Relations

Edited by Glenn and Denny Griswold. Funk & Wagnalls, N. Y., 1948, $7.50.

A book such as "Your Public Relations" could not or would not have been produced just a few years ago for two reasons: (1) many of the concepts and techniques included in the present volume have been perfected only since the war; (2) the air of secrecy and mumbo-jumbo with which pioneer practitioners once surrounded their "art" has now given way to an enthusiastic crusade to "tell all" and thus *sell* businessmen generally on public relations as an essential function of modern management.

At every sales meeting, convention, management seminar or trade association round-up—wherever businessmen get together—public relations comes in for discussion these days. A vast amount of PR indoctrination material is now being produced today. No college curriculum in business administration is complete without a course in public relations. Labor unions also are beginning to go in heavily for their own versions of public relations.

In fact, interest in public relations is no longer confined to the initiated. Its practice in an organized fashion is now an accepted part of the overall job of running schools and colleges, social agencies, governmental bodies, youth groups, churches and other organizations, large and small, as well as business enterprises. Even the so-called "man in the street" is intrigued. The March of Time film "Public Relations—This Means You!" has been exhibited to some 30,000,000 people.

Now, anyone with a real interest in keeping up with the parade can, for example, steep himself in the management philosophy underlying the public relations of such leading exponents as General Foods or American Telephone. Further, anyone with eyes to read can now learn in some detail "how it's done"—how the action phases of representative public relations programs are formulated and carried out to achieve the results intended.

"Your Public Relations" is billed as the "standard handbook" on the subject, covering the history, principles and techniques of this rapidly evolving profession. With chapters by 32 authorities and supplemental comment by its experienced editors, the volume *does* provide a practical working guide, based on actual case histories, to anyone who would seek more knowledge on how to deserve, win and hold public understanding and approval.

A glance at the table of contents alone indicates the strides made in recent years in spelling out the "how to" aspects of public relations work. The book opens with a chapter on "Management's Stake in Public Relations" by such a practicer of what he preaches as Harry Bullis, board chairman of General Mills. Then comes a piece on PR for small business, effectively torpedoing the notion that only giant corporations can afford public relations programs. Organizing for public relations, including how to set up a department and use outside counsel, encompasses four chapters, each prepared by a specialist in the particular field covered.

The distinct problems of building better relations with employees, customers, stockholders and the community likewise are discussed by four different experts. Opinion surveys, publicity, press relations, advertising and other PR media are treated separately, and such techniques as the currently favored Open House come in for review. There is even a chapter on the important but often neglected need for training employees and executives in the fundamentals of maintaining good relations with a company's various "publics."

A book of this kind, done by so many hands, is necessarily uneven in tone and quality. And, like most "anthologies," any reader can quarrel with some of the individual selections made. But, as the chef said of the stew, there's bound to be something in it you'll like particularly. And all of it is likely to be good for you. The top bracket names among those who serve up the fare add lustre to the feast.

Reviewed by:
BROOKS DARLINGTON
Lecturer in Public Relations

Selecting the New Employee: Techniques of Employment Procedure

By Paul W. Boynton. Harper & Brothers, New York, 1949, $2.00.

A hard-hitting, down-to-earth treatise, this book concerns itself almost exclusively with the recruiting aspect of a personnel program. The only deviation is at each end of the book: the first two chapters do a good job of discussing the philosophy of employment and the qualifications of the employment man; the last two chapters deal with supplementary employment aids as well as induction and training.

In between the author presents the six sources from which new employees can be recruited: (1) Within the organization, (2) Through the front door, (3) College recruiting, (4) Commercial and public employment agencies (this reviewer would suggest the addition of the consultant here), (5) Commercial advertising, (6) Letters of application. Each of these sources is penetrated by a keen mind which obviously has been sharpened by experience.

The section devoted to college recruiting is particularly good. It ought to be a *must* reading for our current crop of college graduates, but its message is directed by implication to the undergraduates who may yet be saved.

Another meaty section is titled "The Functioning of an Employment Department." It is short, but good. Finally, that part devoted to the purposes of the interview has practical suggestions which are certainly worth-while even for the experienced interviewer.

For a book that admittedly offers nothing new but which plays old tunes with staccato notes, it is definitely recommended.

Reviewed by:
C. LLOYD THORPE
Lecturer in Human Relations

Briefer Guides From The Management Library

United States International Timber Trade In the Pacific Northwest

By I. M. Elchibegoff. Stanford University Press, 1949, $7.50.

Here is a comprehensive analysis of the postwar timber situation in the United States and 26 other Pacific countries. The author compares economics and geographical factors, examines resources, land utilization, and population, and considers costs, tariffs, and transporation.

The Social Security Almanac

National Industrial Conference Board, Studies in Individual and Collective Security No. 7, 1949, $4.00.

A handbook of facts about voluntary and compulsory provision for Social Security in the United States and other countries.

Training Salesmen

Policyholders Service Bureau, Metropolitan Life Insurance Co., N. Y.

A study of salesman training in industry based on a survey of 200 selected organizations who are known to have made good progress in the development of training programs. The report is a comprehensive digest of sales-training practices, with practical details on training organization, program development and presentation, training aids and methods.

The Practical Meaning of Management Statesmanship

American Management Association, Personnel Series No. 124, 1949.

The competition for leadership in a welfare economy. The challenge of world trends to American management statesmanship. Positive management action in human relations. Top management views the job ahead in industrial relations.

Reviewed by:
BERNA M. CARLSON
College Librarian

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INDUSTRIAL WEST

Trends in Industrial Relations Thinking and Action

WARNING flags of what to watch for in the 1949 trend of industrial relations and personnel management were so well sprinkled through the sessions of the Pacific Coast Management Conference at Berkeley April 19-20 that those in attendance were brought up short with the realization that now is no time to go to sleep at the switch.

This conference, sponsored by the California Personnel Management Association, successfully rose out of the flat spots which afflict many meetings.

Here are a few of the flags, followed by a summary of some of the outstanding information presented:

¶Your employee maybe joins a union for the same human reason that you join Rotary, Kiwanis or other such organizations.

¶Remember, you are not the emotional center of the universe; there are a lot of other people.

¶There is no simple answer to the problems of living with human nature.

¶We need more and more to deal in *human satisfactions.*

¶Employees must be made to feel they are liked and respected by management, and each one is necessary to the success of the enterprise.

¶Ask the help of your employees. Explain your pressing problems. and they will lose the idea that you are high-hat.

¶Learn the language of the shop, or get someone to talk who can do so.

¶Bring the foremen fully into the management family; it will pay in every way.

¶Stop, look and listen when planning company pensions; get expert help, because the unions have some ideas that may cost you lots of money.

¶California unemployment insurance is being manhandled. The law is a patchwork with too many loopholes.

You Don't Know Why They Join

LEO. M. CHERNE
Executive Secretary, The Research Institute of America, Inc., New York

ANY speaker who offers to assure profits is out. If we are to have assured profits, we must lose the many values of a competitive society. That to Americans is fantastic.

For ten years we have had close to an assured profit system. Now we feel doom with the first return to competition. A depression is thought to be just around the corner when a $25 cut is made in a low-cost automobile.

In a recent survey of 10,000 business men, the average stated that if they were to go back to school they would want to spend 34% of their time studying psychology.

We all spend considerable time trying to deal with other human beings, with our thoughts centered on ourselves. None of us can possible be the emotional center of the universe.

We can, for example, discount the notion of the average executive that because there are 15,000,000 dues paying union members in this country that they are organized solely to make demands on employers. The facts dispute his belief. Many of these have joined unions because they want to identify themselves with their fellows.

Schumner Schlichter, an outstanding authority in this field gave three outstanding reasons for working people joining unions:

1. Executives have failed to provide workers with a sense of identity with the enterprise;

2. The worker can't communicate with the executive; and,

3. No feeling of importance to the work in the plant on the part of the average employee.

You as an executive, have no more to overcome in dealing with employees than the unions have in dealing with those who work for them. Our society is one of economic differences. Buyer, seller, employer and employee, illustrate these differences. All must communicate, and preferably verbally with each other. All must deal to create confidence in the other fellow.

Yet, the essence of our American system is a training through childhood in hostility toward authority, toward parents, teachers and so on. How can we expect no hostility on the part of a boy so reared, toward the bad-natured cuss who pays his salary, unless he has a pretty good understanding of the facts involved in the business?

Break-Even Point Must Be Found

R. G. KENYON
Vice-President Southern California Edison Co., Los Angeles

IF a business enterprise is carrying on any activity that is not making or saving money, that deal is wrong. So, the industrial relations department should help to make every dollar of the payroll profitable. This is done by putting just the right amount of oil—not too much, nor too little—from time to time into the stream of human nature with whom we directly associate. The break-even point is when the cost of employee lubricant equals the profit increase you get from your employees. And this point fluctuates widely.

Nothing is so important than that the business should make a profit. Sometimes gadgetry gets more interest than the solvency of the business. Job evaluation, training programs, and other activities are desirable, but should not be used unless they can be translated into net profit for the enterprise.

Our first job is to convince the individual employee that his management is interested in him. Interest in the individual

(Continued on Page 74)

GENERAL WAGE CHANGES IN PACIFIC - ROCKY MOUNTAIN REGION

NOVEMBER 16 TO DECEMBER 31, 1948

NOTE: This tabulation only reports changes. Information on the large number of contracts renewed without change is unavailable. Therefore the tabulation should not be construed as an indication of the overall trend.

Compiled from various sources by Bureau of Labor Statistics, Wage Analysis Branch

(Where initials of unions are given below: A=A F of L; C=CIO; I=Independent)

	Location	*Date*	*Amount of Increase*	*Number of Workers*	*Other economic Benefits*
CALIFORNIA					
Superior Fireplace	Los Angeles	Retro. 12/9/48	10c	USA - C—40	
Smithy's Muffler Co.	Los Angeles	Retro. 9/1/48	7½c		Improved vaca. & holiday & group insurance
Hugo New Corp.	San Diego	1/4/49	17c	IAM-I—20 Mch.	5c add. effective 3/1/49
American Hair & Felt Co.	Los Angeles	1/13/49	7½c	UFW - C—45	
Los Angeles Felt Co.	Los Angeles	Retro. 9/1/48	7½c	UFW - C	
Bemis Bro. Bag Co.	Los Angeles and Maywood, Calif.	1/20/49	7c	TWUA-C—84	
Fresno Consumers Ice and Valley Ice Co.	Fresno	1/1/49	$5 per mo. or 3½c hr.	IUOE-A—35	
Central Calif. Ice Co.	Bakersfield	1/1/49	$10 mo. or 5c hr.	TCWH-A—25	
Universal Enterprise Co.	Los Angeles	1/21/49	10c	ICWH-A—72	
Sacramento Valley Associated Industries	Sacramento	1/7/49	25c	TCWH-A Carpet, Lino. & Tile Wkrs.—45	
Produce Comm. Merchants	East Bay Area, Calif.	1/7/49	$5.50 week	TCWH-A—79 truck drivers	Improved holidays and vacations
Pacific Tankers, Inc.	San Francisco	About 12/16/48	12½%	MMP-A	Incr. OT & night rates
Pacific American Shipowners Assn.	San Francisco	About 1/21/49	8%	MCS-C—120	
Los Angeles Coat & Suit Mfrs. Assn. (150 firms)	Los Angeles		5c	ICWH-A ILGW-A—500 (See note)	Applies to newly org. misc. craft wkrs. & ship clerks; plus reduced work week 44 hrs.
Amer. Pacific S.S. Co.	Los Angeles	1/1/49	12½%	MMP-A—200	
Amer. Pacific S.S. Co.	Los Angeles	1/1/49	12½c	MEBA-C—200	
COLORADO					
Liquid Carbonic Corp.	Denver	1/10/49	12c	ICWH-A—40	
Linde Air & Prest-o-Lite Co.	Denver	1/2/49	10c	ICWH-A—25	
Farmers Grain & Bean Assn.	Denver	1/1/49	10c	ICWH-A—35	
4 Liquor distrib. companies	Denver	1/15/49	8c	ICWH-A—50	
Denver-Chicago Truck. Co.	Denver	Retro. 12/12/48	10%	OEIU-A—45-65	
Baker Truck Rental, Inc.	Denver	1/19/49	6c	37	Add. 3 paid holidays
Neicker Transfer Co.	Denver	1/15/49	7½c	25	
C. S. Card Iron Works Co.	Denver	1/17/49	8c	IAM-I—50	
C. S. Card Iron Works Co.	Denver	1/10/49	8c	BISB-A—50	
Inland Paper Box Co.	Denver	1/5/49	7c	IPPA-A—48	
Denver Sand, Gravel & Ready Mixed Concrete	Denver	1/7/49	10%	IUOE-A—50	
OREGON					
Building laborers	Portland	1/1/49	17½c		Hourly rates: Carp'ters $2.10, laborers $1.70
Electricians	Portland	1/49	35c	A	Hourly rates $2.35
Lathers	Portland	1/1/49	25c	A	Hourly rates $2.50
Painters	Portland	1/1/49	22½c	A	Hourly rate $2.10; 50c day incr. to $4 in subsist.
Plasterers	Portland	1/49	25c	A	Hourly rate $2.60
Roofers	Portland	1/49	20c	A	Hourly rate $2.20
Sheet metal workers, helpers	Portland	1/49	20c sh. met. wkrs. 18½c helpers	A—200	Hourly rates: Sheet met. $2.15; helpers 1:30 min.
Carter Rice Co.	Portland	Retro. 10/1/48	9c		
Portland Gas & Coke Co. (Production workers)	Portland	1/1/49	12½c	ICW-A—600	
WASHINGTON					
Washington State Restaurant Association	Bremerton	12/15/48	50c - $1.78 day	HREU-A	10c day for laundry; now 45c wk., add'l vaca. benefits
Seattle Trasp. Commission	Seattle	3/1/49	Avg. 10c	SERMCE-A--1800	
MISCELLANEOUS					
International Shoe Co. (50 plants in U.S.)	10 states	2/7/49	Decrease 3%	BSW-A; USW-C; URW-C; 25,000	Decrease based on decline in C.L.I.
General Motors Corp.	Various states	3/1/49	Decrease 2%	UAW-C; UEW-C; 270,000	Automatic quarterly adjust., based on BLS Consumers Price Index
General Motors Corp. salaried	Various states	3/1/49	Decrease of $10 per mo. for 10 months	No union given; 68,000	Quarterly C. of L. bonus decr. from $40 to $30 payable in June

(Continued from Page 72)

expressed by the management will make a much better, happier person of him. His attitude, if wrong, will change.

You must change the attitudes of many old-timers who have been promoted. These people quickly lose the feelings they held as employes toward th employer and his old job. The personnel man must keep that former experience right up in front of his mind.

The new employees feel like you need to feel, and think as you did:

Employee Attitudes

1. They are inclined to believe they work too hard and get too little pay;

2. That the boss is money-mad; and,

3. No reason for the worker to worry; the government will take care of him.

Now, two courses are open to the personnel man:

1. He can sit down and cry; or,

2. He can attempt to reach the individual with some counter-material.

Personnel Man's Function Today

EUGENE J. LYONS
Vice-President, Personnel Merck & Company, Inc., Rahway, N. J.

IN the competitive period now beginning, top management is asking itself whether the personnel department function is necessary in this period. Industry has a great many officers, who usually outrank the personnel officer, who are not sold on the idea that this department has improved employer-employee relations, and some of this feeling is soundly based.

To Be Effective

The personnel department has no place in the line organization; it is a staff service organization, and to be fully effective as such, the chief should have the same status as the production or the sales manager. He should be responsible for endless, but necessary, research. He must be able to furnish the line organization executives with the necessary facts and ideas with which to meet the arguments of trained union people and the complex legal problems the management might need solved in its dealings with organized labor.

Human Engineer

Even as the safety engineer trains the line organization, so should the personnel man be a teacher to promote the idea that better labor relations are the result of a better understanding, by supervisors of the human relations problems inherent in their daily and hourly contacts with employees. Get every first line superintendent to accept his full and natural responsibility for maintaining good labor relations in his unit. A lot of sound persuasion may be necessary, and that is properly the job of the personnel man. When he has the executives trained, he then should keep the good work up, by serving them as necessary and encouraging them always.

Pension Pitfalls Are Numerous

JOHN M. HINES
Director Group Annuities, The Equitable Life Assurance Society, New York

PENSION practices are changing all the time, and usually through compromise, as the older plans are found to be inadequate through experience.

Living costs cause the chief problem, but the higher paid salary people are finding income tax also a burden. Many companies try to meet this problem by adding temporarily monthly sums to care for the present low money value period.

How to Base Pay

Some are now basing pensions on the final working pay. This is new and has much appeal, but any company considering it should go carefully, because it might prove to be most dangerous. Had this been done 10 years ago, the company responsible would find an overall cost increase in its pensions of around 55 per cent.

At a meeting between invited representatives of insurance companies with one of the larger labor unions, the insurance men found themselves faced with equally competent insurance people, representing the union. The insurance men were told benefits could be increased 50 per cent without increasing the cost "but just a little." This, "they did with mirrors." Also it appeared, they wanted the pension plan to be a year-by year negotiation.

Fewer people now are dying in all ages every year, which adds to pension costs an unknown figure when the policy was based and payments to be made in line with the life expectency of the 20's and the 30's. "We did work with a 1920 table, then with a 1937, but today we do not have the kind of table we need and the death rate continues to fall each year."

Get the Right Plan

If crowded to the point where you must do something, get a plan to suit your needs, but have it prepared by a sound actuary. One suggestion of value is that the pension be a flat dollar payment of, say, at age 65, $100 a month but *including* whatever the Social Security payment is. That would average out approximately at present $45 per month. This payment by Social Security and $55 per month for the employer. This would cost the employer 9.2 cents per hour on present experience.

No Great Changes Under T-H Law

ROBERT LITTLER
Attorney, San Francisco

THE Taft-Hartley Law in the first 18 months has affected the actual conduct of industrial relations very little. It has weakened the power of left wing leaders. New duties on unions have not been burdensome.

Spend the Time

If business spent as much time on dealing with labor problems as it does on production and sales, say roughly, one-third of its time, both businessmen and labor unions would be a lot better off. Labor unions are now the most powerful private organization in our society.

Should Overhaul Unemployment

FRED W. KRAFT
State Senator, San Diego, Chairman, Interim Unemployment Committee

AN 18 months study with the help of seven technical men revealed the present law to be a patchwork which should be rewritten entirely.

Many persons are now getting benefits who should not, and there is no way to estimate the total of such payments, but unquestionably they run into a lot of money.

1948 Record Year

Last year was the highest in both employment for covered employees and yet also the highest in payment of unemployment insurance. Not less than 20 per cent of the payments made were on wrong claims, or somewhere around $30,000,000. Not fraudulent but due to loop holes in the law and bad practices, largely growing out of misinterpretations by the department of the legislative intent in the law. Too much emphasis placed on the federal statute that unemployment must be paid when due.

Many people who used to follow such occupations as vegetable packing, resort workers, lumber workers, not in a large measure, stay home and collect unemployment insurance. Some employers are encouraging people to do this.

No Set Payments

Payments should fluctuate with the value of the dollar, or the current wage. The present system encourages unemployment and should be corrected. We are bringing about a break-down of our society through individual demoralization and by permission of the law.

This Fork Truck DOES MORE WORK

FOR LESS "PAY" because it has

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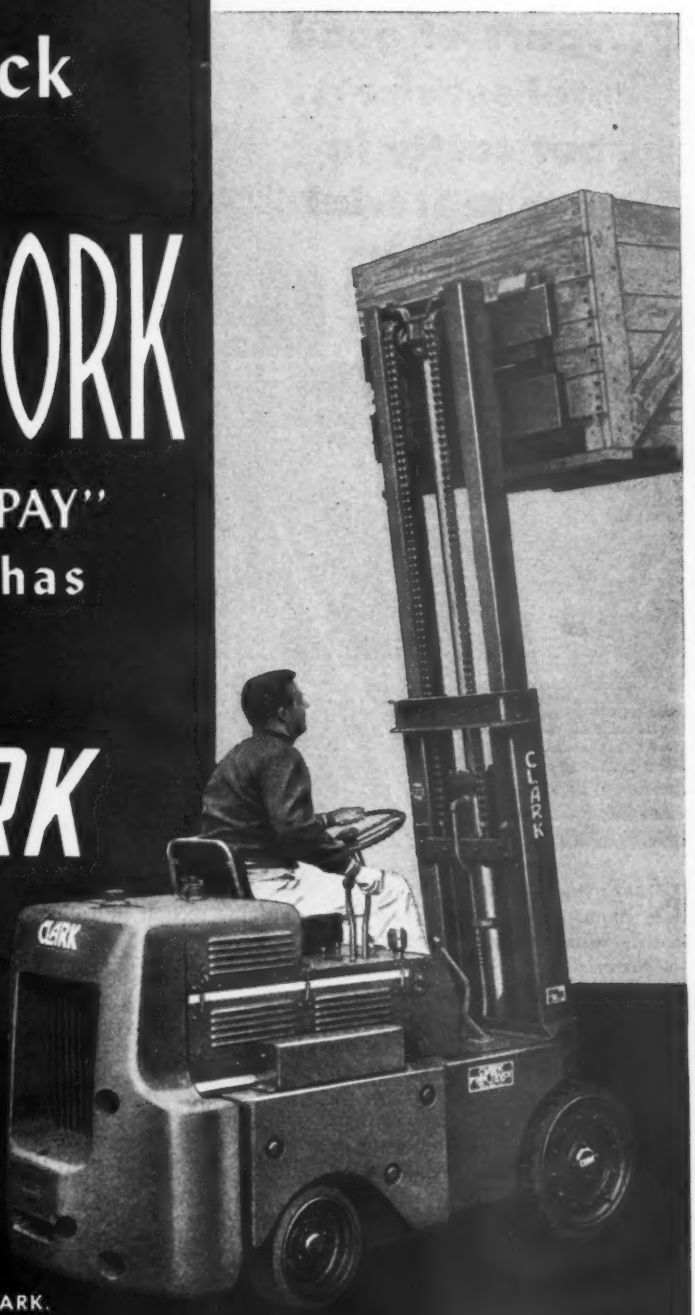

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To help get the answer—to enjoy unsurpassed counsel on any materials-handling matters—CONSULT CLARK. Please direct inquiries on your business letterhead to address listed below.

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CLARK EQUIPMENT COMPANY

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AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

"BELL-HOPS"
...part of good hotel service... but costly in your material handling

KEEP manual handling to the minimum and you cut handling costs. Whatever has to be moved — materials loose or in containers, units, assemblies, castings or cartons — you can move it faster — at lower cost on conveyors.

An experience record of more than 40 years — serving all classes of industry and business — heavy or light manufacturing — handling steel or cosmetics — qualifies Standard to be of service to you.

Call on Standard for any conveyor requirement—a complete engineered system — a portable unit — a light, portable section of roller or wheel conveyor.

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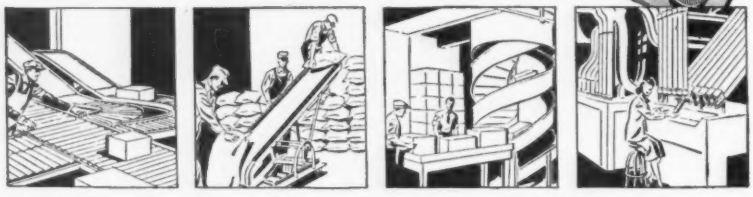
Send for Standard's General Catalog — see how conveyors are used to best advantage in every field of industry. Ask for Bulletin WI-69.



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Labor Act Proves Out In Jurisdictional Disputes

The Taft-Hartley Act is proving its effectiveness in the field of jurisdictional disputes, reports M. J. Muckey of the Industrial Conference Board of Tacoma.

At the Atomic-Energy project at Richland, an NLRB trial examiner ruled that a contract between the AFL building trades and a sub-contractor was illegal because of a provision for exclusive union hiring and found the sub-contractor guilty of unfair labor practices for discharging a machinist at the demand of the engineers' union. The firm was directed to withdraw recognition of the building trades group until they have been certified as representative of the employees.

At Juneau, Alaska, a federal jury returned a $750,000 verdict in favor of the Juneau Spruce Corporation against the longshoremen's union for damages resulting from picketing in the jurisdictional dispute with the IWA for the right to load company barges. The picket was also enjoined.

The NLRB also for the first time stepped into the 37-year old dispute between the machinists and carpenters over installation of plant machinery. The machinists, employees of the firm, were installing the machinery and carpenters picketed the plant in an attempt to take over the job. The ruling of the NLRB was apparently wide and deeply significant. The decision was that an employer may assign the work to his own employees as he chooses, declaring that the Taft-Hartley Act gives the employer freedom of action.

Wages Stabilizing

Wage settlements in the Pacific Northwest as listed by the Industrial Conference Board reveal that out of a total of 63 settlements, 26 have been without wage increase. Twenty of the 26 have been without any change, 4 have been for increases below 5c, 9 at 5c, 9 at 10c, and the remainder range from 12½c to 30c.

Vacations With Pay Increase

An analysis of 1,241 union agreements in effect in California in 1948 reveals that 1,106 contracts, or 89 per cent of the total, granted paid vacations. The trend toward the general practice of paid vacations is shown by the fact that in 1941 only 54 per cent of the contracts studied by the Department of Industrial Relations allowed the employees a vacation with pay.

Nearly 20 per cent of all contracts analyzed in 1948 provided for sick leave with pay during illness.

Shipped in Bulk; Packaged in the West

"One Northern California cannery with a liquid filler line (for fruit juice) has started running on a maple syrup (nationally advertised) that is being brought by tank car to the Coast and packaged here," says Western Trucking News Service. "A hair tonic will start being bottled in two spots on the Coast for substantial savings. Even such comparatively small items as tooth pastes, shaving soaps, etc., in collapsible tubes are being packaged on the Coast for national brands on a custom basis. The example of bulk shipping that westerners know so well—that of tank cars of California wine going east to be bottled at destination—is simply being reversed in number of cases.

"Maybe typical are the changes taking place in citrus. For years, California has been the leader and a quality fruit has commanded a premium over Florida and Texas. Californians, for probably good reasons, chose to ship the fruit in boxes and frowned on canned orange juice as being a poor imitation.

"Currently, the situation has changed. Rather than shipping the fruit, the trend is to ship a frozen concentrate. The trade likes it. Californians, against their wishes, are being forced to follow suit. And current talks are along the lines of constant procession of refrigerated trucks eastbound carrying the stuff at rates making it competitive with Florida juice. Northwest frozen fish is rolling east in trucks with shippers securing a faster transit than the rails and up to now a lower rate."

Federal Census

The Bay Area Council has received notice of official Federal action adding Solano County to the San Francisco Bay Metropolitan Area, thus providing a larger six-county Bay Area for Federal census studies in 1950 in manufacturing. The San Jose-Santa Clara County area is shown in a separate metropolitan district, which can be included in the Metropolitan Bay Area.

Bay Area Real Estate

Resale market for houses shows a definite recession over 1947 and 1948 for 96 houses studied. Financing trend is toward higher interest rates, although FHA and the Veterans Administration hold to a 4-4½ per cent rate. Banks and other loan organizations hold that 5 per cent and upward is fully justified under present conditions. Real estate loans are holding up, however.

Some signs of lower prices appear on the horizon, such as better labor productivity in some trades, better grading and competitive trends in supplies, indications of lower material costs, lowering of profit margins by sub-contractors and others, and diminishing number of costly delays due to increased labor and materials supply.

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VOLUMATIC MODEL

Now *all* your departments can handle their copying jobs with a single versatile machine: the Bruning Whiteprinter, Volumatic Model 93. This brand new machine at last provides you the necessary volume and high speed (up to 105 sq. ft. per minute). At the same time, through simpler operations and less wastage, it reduces copying costs.

The Volumatic produces sharp, highly legible copies of engineering drawings, documents, or *anything* that is printed, drawn, written, or typed on a translucent medium. It copies charts, plats, letters, invoices, financial reports—and many other items. Its operation is so simple that a girl can learn to run it in less than an hour.

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CHECK THESE BW ADVANTAGES

No vents or exhaust fans: The Bruning Model 93 is completely odorless . . . can be used anywhere in the office without the slightest offense.

Built-in transformer: Protects you against voltage fluctuations common to power lines. Assures longer lamp life, more uniform prints, savings on materials.

No plumbing connections: There are no pipes to connect, no water to supply or drain away. The Model 93 is mounted on casters, is moved where needed.

Uniform developing: Both sides of the print receive a thin, measured film of BW Developer solution at once. Assures flat prints, never under- or over-developed.

Send today for full information. Let us send you a file of literature describing the new BW Volumatic Model 93 and other Bruning Whiteprinters, and the BW Mediums you can use with them. See for yourself the extreme versatility, economy, and speed of these machines. There is no obligation.

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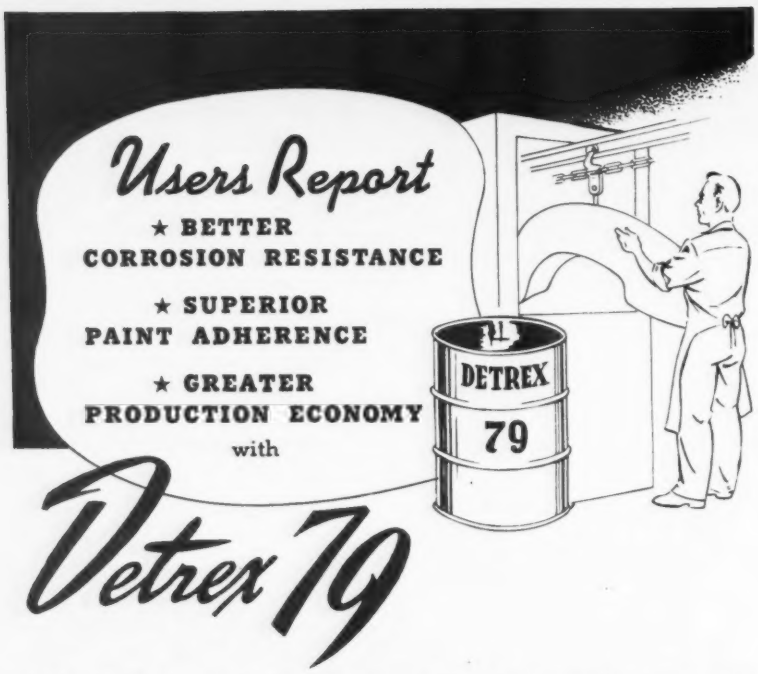

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• DETREX 79 cleans and quickly produces a fine tightly-adherent crystalline phosphate coat on steel and cast iron parts. This phosphate coated surface results in superior adhesion of paint finishes; and under standard salt spray tests, parts treated with Detrex 79 prior to painting show excellent corrosion resistance.

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For these and other reasons, Detrex 79 provides a phosphate coating of outstanding quality with exceptional speed and economy—as proven by extensive field tests in various manufacturing plants. For complete information, call the Detrex man in your locality—or write direct for free literature.

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Payrolls to Bump Relief Rolls

Arizona's economic deep-thinkers are at it again, and they have come up with a program designed to accomplish the greatest good for the most people.

Jobs for people, with Arizona enterprises built on out-of-state dollars, are to be the objective in a new and vigorous program of Greater Arizona, Inc., it was recently announced following a recent successful economic clinic held by the statewide development organization in Yuma.

This conference, one of the first in the state's history in which both labor leaders and bankers jointly discussed and counseled on Arizona's economic problems, also developed a new fact-finding and action technique which was lauded by Elmer Vickers, Sr., secretary-treasurer of the Arizona State Federation of Labor, and enthusiastically supported by George V. Christie, vice president of the First National Bank, who prophecied: "Unless we provide payrolls, many of our citizens will be on relief rolls."

A panel of experts recruited by the Yuma Chamber of Commerce, analyzed the economic needs of their area, and showed a striking similarity between the problems of the Yuma region and the rest of Arizona in general, with the exception of the water problem.

William B. Chamberlain, manager of Greater Arizona, Inc., identified as Yuma's principal objectives—as well as those of all Arizona, the following points: (1) greater diversity of enterprise; (2) additional low-cost housing; (3) new tourist facilities; (4) national advertising of area assets; (5) over-all tax revision; (6) regional air transportation service.

Greater Arizona leaders further pointed out that this Yuma conclave was also the first in the state's history in which outsiders participated as "resource people" only. The object of these sessions, they emphasize, was to assay the assets and liabilities of the Yuma area, thereby discovering the negative factors which can be improved by statewide research and action, as well as those which cannot.

Within the next year, it is expected that 14 such county clinics will have been held. At the end of a year, an exhaustive "on-the-ground" inventory of the state's potential productivity will have been determined.

The total schedule of assets thus compiled will be used for presentations outside Arizona, while the negative aspects of the study will be used locally, affording a basis for legislative, labor, and educational action of a corrective nature.

George Babbitt, Flagstaff, chairman of Greater Arizona, Inc., reveals that "Already we see signs that our heightened activity is productive. It will pay off—in dividends to all Arizona."

THE WEST ON ITS WAY

ARIZONA

NEW PHOENIX TEXTILE PLANT—Sun Ray Garment Company, owned and managed by H. M. Dreiseszun has just started production of sports clothes at 28th Street and Henshaw Road, in the old Aviola factory. Plans are to add lines of women's slacks, blouses and skirts, with employment rolls reaching 75 persons at peak production.

BULK OIL PLANT—A. M. Hancock, Union Oil dealer in Blythe, California, is building a wholesale bulk plant in Parker, to handle Union products. Charles Bryce will be the local manager.

CALIFORNIA

PIPE LINE FROM CANADA TO CALIFORNIA—A project has been initiated for construction of a 1,400-mile 30-inch natural gas pipe line at a cost of $175,000,000, to run from the northern part of Alberta, Canada, to Vancouver, B. C., and then south through Washington and Oregon into northern California. Westcoast Transmission Co., Ltd., has been created for the purpose of handling the Canadian end of this line. It is expected that a United States firm will be created to build and operate this end of it. Pacific Petroleums, Ltd., of Canada, initiated the project; associated with them is Sunray Oil Corp., a substantial stockholder in Pacific Petroleums. Eastman, Dillon & Co., New York, will make the financial arrangements.

NEW FROZEN FOOD PLANT—Delta Foods, at 809 S. Center St., Stockton, is a new quick-frozen food concern employing about 140. They plan to package over $1,000,000 worth of foodstuffs before the end of the '49 season.

PIPE FOR PIPELINES—New pipelines planned have caused such a demand for pipe that Western Steel Corp. is planning an increase in its pipe manufacturing capacity at the South San Francisco plant.

L. A. GEN. FOODS MOVES TO BAY AREA—General Foods Corp. is constructing a new food processing plant on a 27.5 acre tract in San Leandro, to which they will move the Los Angeles operations. The plant is expected to employ about 200 persons, with all the Los Angeles employees given first chance.

$3,325,000 FOR 40,2000 HORSES—Pacific Gas & Electric is building a new Colgate powerhouse on the north fork of the Yuba river. Estimated cost is $3,325,000. It will be equipped with a 40,200 horsepower turbo-generator unit.

COLUMBIA CEASES COMMERCIAL CASTING—Columbia Steel Co. have announced that they are discontinuing production of commercial castings at the Pittsburg, California, plant. All other steel-producing units of the plant will continue in operation.

JOHN DEERE PREPARES—John Deere Plow Company has bought 40 acres of industrial property in San Leandro near Peterson Tractor Company, for a reported $250,000. A distribution and marketing headquarters will be established there after the freeway is completed in 1952.

LEVI STRAUSS BUILD—Levi Strauss and Co. will erect a $200,000 building in San Jose at San Augustine and Terraine Sts. The new plant will have 44,000 square feet of floor space.

FIBERGLAS PLANT—Owens-Corning Fiberglas Corp.'s $7 million plant in Santa Clara will start in production July 5, with an initial payroll of 250 persons. Plans call for the payroll to be stepped up from month to month under impetus of a $50 million annual business.

PILOTS BE SEATED—Vic Pastushin Industries, Inc., Los Angeles, has received an army contract for production of pilots' seats for North American Aviation T-28 trainers. Also received is a contract for external fuel tanks for North American B-45 four-jet bombers.

SIX-MILE GAS PIPE—Standard Oil Company of California has awarded a contract to Alex Robertson Co. for construction of about six miles of six-inch pipe from Montebello to connect with a system serving the El Segundo refinery. Project, costing about $150,000 will be finished late this month, to carry natural gas. It will replace an existing 30-year-old line, which will be abandoned.

AIRPORT OIL STORAGE—Shell Oil Company has leased 11,400 square feet of land at the Oakland Municipal airport on a 20-year term, for bulk storage of aviation gasoline and oils.

NEW TRUCKING TERMINAL—Consolidated Freightways has completed a $150,000 motor freight terminal at Oakland, to service all the firm's local equipment and units operating between there and Idaho. The building has accommodations for 46 trucks at one time, and a 540-foot chain conveyor to speed handling.

NEW OIL DRILLING FIRM—Pumice Mountain, seven miles from Calipatria, is the site of a new plant now under construction by Builders' Supply Corp. of Phoenix, Arizona. The plant, when completed, will crush, screen, and size the rock obtained from deposits believed to be the largest in the United States.

GEN. FOODS QUICK-FREEZE PLANT—Immediate construction is planned by General Foods Corp. of a vegetable quick-freeze plant in Ontario, which will afford employment to upward of 300 persons.

MARKETERS EXPAND NORTHWARD—West-Marquis, Inc., Los Angeles marketing and advertising firm, branch out to San Francisco in an expansion of the agency's Northern California activities. Harold H. Marquis, vice president, is in charge of the San Francisco office.

CRATE-RITE MFG. CO. SOLD—Pacific Ports Industries of San Francisco has purchased the Crate-Rite Manufacturing Corp. of Oakland, and will operate it as the Crate-Rite division of the parent company.

• Stauffer Chemical Company have opened their newly remodeled general offices at 636 California Street, San Francisco.

NEW TUNNEL KILN—Washington Brick & Lime Co. at Dishman is having constructed a $300,000 tunnel kiln and driers for the continuous manufacture of brick products, as an addition to their present facilities.

"Though Suppliers' Lists I've got galore,
I rarely use 'em anymore."

"I now rely on Classified—
The fastest guide I've ever tried."

Kettles, pots, pans, mixers—'most everything you'll ever need in the restaurant business or any other business—are listed in handy Classified. When you're ready to buy, find it fast in the Yellow Pages. Just as other buyers will find your products fast, too, when you advertise in Classified.

You'll find it fast in the

YELLOW PAGES

of your Telephone Directory

The Pacific Telephone and Telegraph Company

THE WEST ON ITS WAY

GOLD-SILVER ORE TREATMENT PLANT—California Silver Corp. has started erection of a 50-ton amalgamation and flotation mill at Silver Lake, 7 miles north of Baker, California, to process ore from the company's silver mine near Riggs. Operations are under direction of W. R. Long, vice president, 12707 Matteson Ave., Venice. Corp. headquarters are at 5177 Overland Ave., Culver City.

GOLDEN STATE GEARS TO DEMAND—Golden State Company, Ltd., in a postwar program designed to bring its manufacturing grade milk purchases more closely in line with its anticipated sales needs, has planned the following: Sale of the Smith River plant in Del Norte county to the Del Norte Milk Products Association; Closing of the Tulare plant; Discontinuance of milk purchases at the Merced branch, which is continued as a sales operation.

TOP TO BOTTOM SERVICE—Montgomery Elevator Company has completed moving their sales and service offices in southern California from Glendale to 6250 Santa Monica Blvd., Los Angeles, and they have expanded facilities for the servicing of their electric and hydro-electric passenger and freight elevators in Arizona and California. San Francisco office has also moved to larger quarters at 735 Tehama St.

$35 MILLION BLAST—Kaiser's Fontana steel mill is adding a second blast furnace and 45 additional coke ovens, plus two new mills, at an estimated cost of $35,000,000.

COACH COMPANY CHANGES HANDS—Pan-American Trailer Coach Company, 1501 S. Shamrock Ave., Monrovia, has been sold to Mid States Corp., Chicago, a holding corporation, for about $1,000,000. No name change is contemplated. Jerry Golden is vice president and general manager of the plant.

ELECTRONICS IN ONTARIO—De-Mornay Budd, Inc., electronics manufacturers, have leased Cal-Aero Airport at Ontario for a 15-year term. Having disposed of their New York plant, they intend to install some $325,000 worth of their own equipment and augment it with $225,000 worth of government equipment. The concern will start with about 225 men.

CROCKER LITHO RELOCATES—H. S. Crocker, Inc., printers, lithographers, and stationers, have opened their new $2,000,000 plant in San Bruno.

PETRI PURCHASES—Petri family, California's leading vintners, have purchased K. Arakelian, Inc., second largest independent winery in the country, including bottling and sales facilities at New York and Chicago.

B & W PAINT SPREADS—B & W Paint Manufacturing Co. is building a plant at 15319 E. 14th St., San Leandro, designed to increase their production from 500 gallons to 800 gallons per day. Van Bokkelen-Cole, Oakland, is the contractor.

WIRE CO. MOVES—Ludlow-Saylor Wire Co. offices are now at 656 South Los Angeles St., L. A. 14.

STOCK MERGER—California Cotton Mills Co. and National Automotive Fibres, Inc., are proposing to merge on the basis of the holder of each share of California Cotton Mills receiving 7/10 of one share of N.A.F. stock. Meetings are scheduled in Oakland, California, on July 12, according to word from J. R. Millar, chairman of the boards of both firms.

MILK PLANT SOLD—Golden State Company has sold their Orland manufacturing plant to Sego Milk Products Co., the Western operating end of Pet Milk Co. The Orland plant had been making butter and non-fat dry milk solids.

WHO'S WHO IN WESTERN INDUSTRY—Walker's Directory has come out with the first post-war edition, a 400 page volume listing 7,200 directors, partners, and proprietors of leading northern California enterprises.

UNDERWATER KILLER—Secretary of the Navy has authorized construction by Mare Island Naval Shipyard of a new type "killer" submarine. The keel will be laid early next year, for an estimated spring of 1951 launching.

THE WEST ON ITS WAY

QUICK FREEZE—Delta Foods, Stockton, headed by Carl Reiger and Walter Van Winkle, is a new quick freezer at 800 S. Commerce, in leased facilities of National Ice & Cold Storage Co. Initial production is spinach, brocolli, and asparagus, with bulk of the products packed under private label.

TOUGH STUFF—Permanente Metals Corp. have developed a new aluminum alloy which offers improved strength and finish, designated as 150S. Its properties are described as intermediate between 3S and 52S.

27 MILLION BOARD FEET—Sugar Pine Lumber Co., operating the Arcata Manufacturing Co. at Arcata, has purchased from Six Rivers National Forest 27 million feet of timber consisting chiefly of Douglas fir and sugar pine, with some incense cedar, ponderosa pine, and Port Orford cedar. Purchaser is building a band sawmill near Hoopa to cut the timber.

HIGH SPEED PRESSES—Western Gear Works, at their Lynwood plant, are now manufacturing a completely new line of products, consisting of three types of high-speed printing presses.

INTERNATIONAL TRADE MART—Industrial Products Mart, 3750 Wilshire Blvd., Los Angeles, has been incorporated as the International Trade Mart, Inc., organized to facilitate international exchange of goods throughout the metropolitan area. George A. Griffith is president and general manager of the firm which was organized early this year and recently reorganized and incorporated to see not only to national and international distribution of American products but to supplement facilities here for distribution of foreign manufactures.

PEYTON TELEVISION SOLD—Conrac, Inc., manufacturers and distributors of electronic equipment with offices in New York and Hollywood, have purchased the Peyton Television Company, Glendora. They plan to keep and expand the Peyton personnel and plant facilities, and introduce a new plan of television sales for Western retailers.

L. A. PLYWOOOD & SOFTWOOD PLANT—Bessonette & Eckstrom, Inc., 2719 Compton Ave., recently organized firm, will produce plywood and factory lumber in soft wood.

SHINE, LITTLE PAPER—Radiant Color Corp., Oakland, manufactures Velva-Glo Fluorescent paper, in several colors. Used in daylight or in ultra-violet light, it glows like neon.

HEALDSBURG PLANING MILL—Southern Redwood Lumber Co. has started construction on a 25-acre site planing mill at Healdsburg.

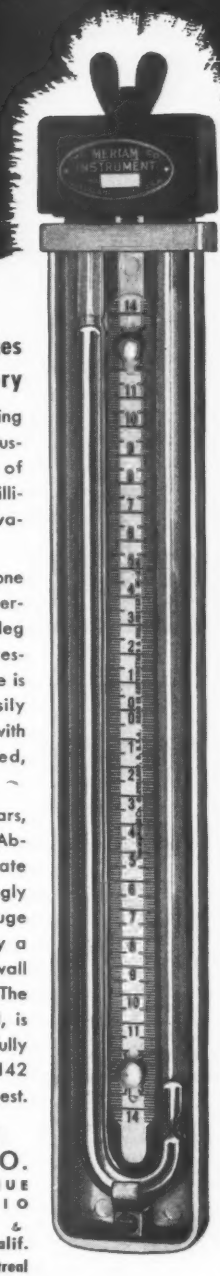
CANNERY EXPANDS—Aron Canning Co., Stockton, is spending about $250,000 on expansion to provide seasonal jobs for 375 persons.

CHILDREN'S WEAR MFGR.—Cal-Ette, new children's wear manufacturer, is located at 88 First St., San Francisco. 20 new jobs will be provided.

AIR FORCE PRIME CONTRACTS—U. S. Air Force recently let prime contracts to 38 southern California concerns. Though the nature and volume of these contracts is not revealed, it is believed that there is a good amount of subcontracting work probably available from these sources. Here is the list of contractors, by cities:

Bell—Thompson Products, Inc.
Burbank—Hydro-Aire, Inc.; Lockheed Aircraft Corp.
Culver City—Airborne Sales Co., Inc.; Collins Engineering Co.; Hughes Tool Co.
Glendale—Adams-Rite Manufacturing Co.; General Controls Co.; Grand Central Airport Co.; Van Dyke Instruments, Inc.
Hawthorne—Northrop Aircraft, Inc.
Los Angeles—Aircraft Equipment, Inc.; AiResearch Manufacturing Co.; Bennett-Magee Corp.; Cannon Electric Development Co.; Delron Co.; Deutsch Co.; Firestone Tire & Rubber Co.; W. P. Fuller & Co.; Joseph Kaplan; North American Aviation, Inc.; Pacific Piston Ring Co.; Products Research Co.; L. N. Schwien Engraving Co.; Tibbets Paint Co.; Turco Products, Inc.
Long Beach—Paramount Steel Corp.
North Hollywood—Pacific Division, Bendix Aviation Corp.; Weston Hydraulics.
Pasadena—California Institute of Technology, Lee A. Dubridge,, Pol E. Duwez, Fletcher Aviation Corp., Howard P. Robertson.
Rosemead—Clayton Manufacturing Co.
San Diego—Consolidated Vultee Aircraft, Nelson-Kelly Co.
Santa Monica—Douglas Aircraft Co., Inc., Leonard E. Root.

A U-TYPE *Absolute* PRESSURE GAUGE BY MERIAM



Measuring directly in inches or millimeters of mercury

This new instrument is proving notably popular in various industries for the measurement of *absolute pressures* from one millimeter of mercury to the equivalent atmospheric pressure.

It is a U-tube manometer with one leg sealed and filled with mercury; the other open tube leg connects to the source of pressure to be measured. The tube is removable and can be easily replaced, when necessary, with another tube, mercury filled, shipped directly to location.

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METZGAR
METZGAR CO.
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GRAND RAPIDS 4, MICH.

THE WEST ON ITS WAY

NEW CULVER CITY INDUSTRY—Metal Textile Corp. of Roselle, N. J., will manufacture metal and asbestos heat insulating jackets for jet aircraft engines in a newly acquired plant at 3583 Hayden Ave., Culver City, employing about 15 persons.

U. S. MOTORS EXPANDS—Pacific plant of U. S. Motors is adding 38,000 square feet of space in which to house machining department for processing gear cases, varidrive motor frames, adapter brackets, motor brackets and vertical motor parts.

COLORADO

RAILROAD BUYS 13 ACRES—Rock Island Railroad has purchased complete rights to thirteen acres of land outside Limon, at the rate of $150 per acre. Although the railroad had a right-of-way through the property, more area was required for construction of new warehouses.

BIG OIL DEAL—100,000 acres of Rocky Mountain oil and gas lands, plus two small Montana refineries, have been sold by John Wight, independent oil and gas operator of Billings, Montana, to E. A. Barnholt of Denver and associates, including R. E. Neher, attorney. Barnholt is general manager for Sierra Petroleum, Inc. Gene Neher will be vice president and general manager in charge of the Solar and North Star refineries, as well as the firm's oil and gas development program. Temporary offices for the yet unnamed organization, are located in the Cooper building, Denver.

CANON CITY BRICKS IN SEPTEMBER—Charles A. Freeman, formerly associated with A. P. Green Fire Brick Co. of Mexico, Mo., has purchased the Canon City plant of Pioneer Brick Works. He intends to reopen soon with around 50 employees, and start production in September.

URAVAN URANIUM PLANT—A.E.C. has entered into contract with U. S. Vanadium Corp. for the rehabilitation and operation of the corporation's uranium-vanadium processing plant at Uravan. U.S.V. has agreed to rehabilitate the plant and company-owned townsite, and install new equipment and facilities for the recovery of uranium. A.E.C. has agreed to buy the mineral production of the plant at a guaranteed unit price until June 30, 1954.

DENVER MATTRESS FACTORY—Southwest Mattress Company, with plants in Tucson and Phoenix, has opened a Denver branch factory to supply Colorado, Wyoming, and Montana. The starting payroll of 40 employees use 15,000 square feet of space, under direction of Dallas Yeargain, who is transferred from the Tucson plant.

NEW PUEBLO INDUSTRY—Barday Distributing Co., with F. W. Barday in charge, is setting up a new neo-lite manufacturing plant at Pueblo, employing about 50 workers. Barday is a branch of J. A. Whyte & Sons, Washington, D. C., who are just starting to operate in the Western states.

TRINIDAD FOUNDRY—Winter-Valentine, Inc., at Trinidad, has been purchased by Frank Fawyer of Los Angeles, who is establishing a new firm—Cast Iron Fittings of Colorado. Foundry operations of this plant are expected to create 100 jobs.

HAWAII

MATSON REPLACES CASTLE & COOKE—Castle & Cooke, Ltd., heretofore Matson Navigation Co.'s general agents in Hawaii, have been replaced by a Matson newly established organization to supervise matters there. M. F. Cropley, Matson vice president, will take over general agency functions, and Castle & Cooke Terminals, Ltd., will continue to handle stevedoring services. June 1 is the date of transfer.

IDAHO

BUTLER BROTHERS BUILD—Butler Brothers Manufacturing Co., Kansas City, plan a $100,000 steel fabricating plant in Pocatello.

THE WEST ON ITS WAY

BIG BOOM FROM MIGHTY ATOM—Arco is about to undergo an economic transfusion, resulting from decision to build an atomic reactor plant nearby. Biggest visible result so far is planning of a $400,000 hotel in Arco—a 100-room hostelry which will take up an entire city block in the town.

COBALT MILL—Cobalt ores from the Blackbird property of Calera Mining Company, a Howe Sound Company subsidiary, are showing promise enough to induce the firm to plan construction of a refining plant, to be carried out by the end of 1950.

MONTANA

HUNGRY HORSE TIMBER SOLD—Flathead Timber Products, Inc., Kalispell, and F. K. & L. Lumber Co., Martin City, were awarded first and second contracts, respectively, for the purchase of 50,090,000 (at $275,560.) and 3,230,000 (at $12,349.80) board feet of standing timber in the Hungry Horse reservoir area, according to Bureau of Reclamation officials.

U. S. vs. JARDINE MINING CO.—$1,116,664 damage is sought by the government from Jardine Mining Co. and William H. Hax, an amount double the RFC loans obtained by the firm on claims which the government contends were fraudulent.

NEW MONTANA FIRMS—N. J. Kemmer, E. O. Peterson, and L. C. Minekier, all of Cut Bank, have incorporated Northwestern Services to deal in farm machinery and equipment, and automobiles and trucks. Capitalization is $150,000. D. L. Jones and I. P. Donovan, of Helena, and W. C. Zimmerman, Portland, are directors of the Montana Shannon Mining Co., capitalized for $250,000.

NEVADA

KENNECOTT COPPER PIT ENLARGES—Ruth open copper pit of Kennecott Copper Corp. is about to be stripped of 1,500,000 tons of waste ore, in order to increase digging capacity to meet tonnage requirements. Isbell Construction Co., Reno, has the contract.

GARFIELD ANODE PLANT—American Smelting & Refining Co.'s Garfield expansion plans include a $3,500,000 anode plant expected to be completed by 1950.

ZINC RECLAIMED FROM OXIDE ORE—A satisfactory process for treating the oxide form of zinc ore has been evolved, and is about to be put into practice at the Basic Reduction Company, Henderson. They are preparing to treat 200 tons daily.

NEW MEXICO

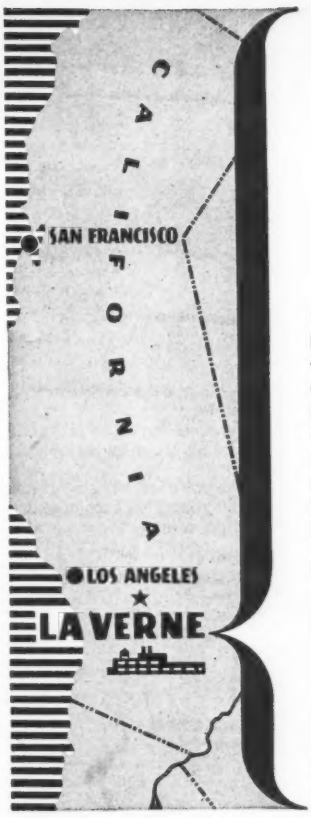
FIRE DESTROYS TIMBER CO. OFFICE—General offices of New Mexico Timber Company, at 1115 North Fourth St., Albuquerque, were destroyed in a three-hour blaze that left smoldering ruins of about $10,000 worth of property.

THREE DOZEN OIL WELLS—Kutz Canon Oil & Gas Co., Denver, plans this year to drill 36 wells on their Kutz Canon structure in San Juan county.

$1 MILLION DEMING ORE MILL—Construction of American Smelting & Refining Co.'s $1,000,000 ore mill at Deming is scheduled soon. The new mill will replace one at Hanover, N. M., and is expected to have an initial capacity of 400 tons of ore daily.

ANOTHER DEMING INDUSTRY—E. V. Simons has established an industrial chemical plant at the former Deming Army Air Field to make sweeping compound from local silica deposits.

MANGANESE IN HOT SPRINGS—Manganese—possibly as much as 80,000 tons of it—has been discovered on Hot Springs streets, in a four-block district within the city limits. J. F. Knox, retired oil man and banker from Dallas, Texas, estimates the worth at $2,500,000, and he is negotiating for a contract covering the mineral rights.



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THE WEST ON ITS WAY

ALBUQUERQUE WINE PLANT—Southwest Distribution Co. has established a new wine-bottling plant at 221 East New York Ave., to bottle California wine shipped in tank cars. Carlo Bachechi is president of the firm which is now bottling at the rate of 750 cases per day.

OREGON

PACKER-FREEZER BURNED OUT—F. G. Lamb & Co., of Freewater, suffered $250,000 damage from fire early in March. Loss was mostly plant and equipment.

CBS BUYS KQD—Columbia Broadcasting System has acquired ownership of station KQW and KQW-FM, in San Francisco.

EARLY AMERICAN PAINT—The Early American Paint & Varnish Co. has been established at Belmont, employing about 20 persons.

NATURAL GAS WELL—A new 10 million cubic feet per hour natural gas well at North Baxter Springs, near Rock Springs, has been developed by Mountain Fuel Supply Co. on completion of tests, the gas will be piped to Salt Lake City.

• Above: Morris P. Kirk & Son., Inc., lead smelters and refiners, recently began operations in this new $500,000 Portland plant

CALIFORNIA TIMBER PURCHASE—Hedeberg mill site, near Fortuna, California, and timber on Fish Creek above Pepperwood, has been bought by C. E. and C. R. Cready of Sweet Home, operators of the East Linn Lumber Co. and McCready Lumber Co. in the Sweet Home area. New timber runs mostly to high grade Douglas fir, enough for a 10 to 15 years run.

WHEAT FIRE—A $350,000 blaze destroyed a huge grain elevator and its store of 10,000 bushels of wheat at Moro, Oregon. The grain stock was part of last year's bumper crop being held there because of lack of storage space in Pacific Northwest dock areas.

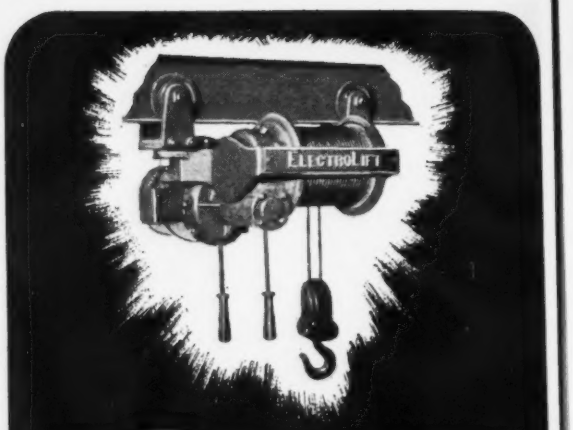
INTERNATIONAL HARVESTER TO MOVE—IHC has bought a 7½ acre site at Milwaukie, where they will spend more than $750,000 on construction of a warehouse and Pacific Northwest headquarters. Upon completion, scheduled for 1950, company personnel will be moved from Portland.

P.P.&L. EXPANDS—Athena Light & Power Co., Athena, to whom Pacific Power & Light Co. has been supplying power in recent years, has now been purchased by P.P.&L. for about $80,000 from Preston-Shaffer Milling Co.

SUNSHINE BISCUIT TO MOVE—A new warehouse at N.E. 13th Ave. and Lombard Place, Portland, is being built at a cost of about $150,000 to be leased to Sunshine Biscuits, Inc. This warehouse for the Portland area will eventually displace present leased facilities.

INDUSTRIAL WAREHOUSE—Barde Steel Co. has recently purchased a 17½ acre tract from Union Pacific Railroad, on which Barde will erect a $2,000,000 industrial warehouse program, adjacent to their present plant.

MOVIE CENTER BUILDING—Intermountain Theater Supply Co., at 264 E. 1st South, is expected to be operating by June 15, in time for the annual Motion Picture Roundup, scheduled for that week. The new building will also house offices for Western Sound and Equipment Company, a subsidiary of Intermountain Theater Supply Company.



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THE WEST ON ITS WAY

UTAH

UNION PACIFIC PLANING MILL BURNS—Lightning started a fire in Union Pacific Railroad's planing mill, just north of their roundhouse at 8th North and 4th West, recently. The mill was nearly destroyed, and a large stack of lumber was consumed by the fire.

BLAST STARTS KENNECOTT FIRE—Started by an explosion, fire raced through the basement of Kennecott Copper's Magna mill a short while ago, cutting off all power and stopped mill operations. Loss was estimated at "several thousand dollars."

SALT LAKE REFINING CO. EXPANSION—Standard Oil Company of California, parent of Salt Lake Refining Co., plans to spend about $10,000,000 on expansion of the latter plant, which will permit the refinery to step up production of crude oil from the present 15,000 barrels daily to about 24,000 barrels.

SHELL SELLS DISTRIBUTION FACILITIES—Denton L. Dunn, former Salt Lake City Shell manager, has purchased Shell Oil Co.'s distribution facilities in the metropolitan area, including the bulk distribution plant and 22 service stations, which will now operate as Dunn Oil Co.

IRONTON BLAST FURNACE SHUTS DOWN—Kaiser-Frazer Parts Corp. will put the Ironton No. 2 blast furnace in standby status this month, due to slackening demand for pig iron.

PIPE PLANT PRODUCES—Pacific States Cast Iron Pipe Co. has started production in their new $3,500,000 centrifugal pipe plant at Ironton. Principal raw material is pig iron from the Geneva Steel Co. Plant capacity is 100,000 tons per year.

RHEEM RESUMES—Rheem Manufacturing Co. will resume Salt Lake City operations in their new $250,000 plant at Industrial Center, formerly used by Remington Arms Co. They will produce a line of stokers, and add gas and oil furnaces later.

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THE WEST ON ITS WAY

WASHINGTON

METALINE CONTACT MINES SOLD—Sullivan Mining Co., Idaho operators, have taken control of the Metaline Contact mines in northeastern Washington. Day Mines, Inc., also of Idaho, is associated with Sullivan in this transaction.

PORTLAND ZONOLITE PLANT—Northwest Insulations Company of Spokane open a new Zonolite factory in Portland, in a 10,000 square foot leased space at 2303 N. Harding Ave.

GRAIN STORAGE DOUBLED—Centennial Mills, Spokane, have started a $204,000 expansion program designed to equip them with 40 more 10,000 bushel storage tanks, bringing the total storage capacity up to 800,000 bushels.

SOCAL INSTALLS TANKS—Standard Oil Co. of California announces construction of more than $1 million in new heating and diesel oil storage tanks at its main plant at Point Wells, near Seattle. Project includes six tanks with a total capacity of about 500,000 barrels.

BELLINGHAM BOAT BUILDERS—Hydraulic Supply Co., operating in Bloedel Donovan converted warehouse, are turning out "Hydra-Cruiser" boats.

SHELL OIL SPENDS IN SPOKANE—Shell Oil Company has set aside $100,000 for new construction in the Spokane area this year.

WYOMING

NEW TRUCK LAW—Under a new state law, trucks operating in Wyoming are not allowed to travel more than 50 miles per hour and must not be closer than 1,000 feet to any truck ahead. Exceptions are pickup trucks weighing less than 4,500 pounds, and passenger buses.

GOLD MINING OPERATIONS—K. Dean Buttler, of Lusk, resident agent for Transierra Gold Mining Company, a San Francisco concern, will be in charge of the firm's projected operations in Niobrara county.

VERMICULITE PLANTS PLANNED—Col. H. C. Anderson, secretary-manager of the Wyoming department of commerce, indicates that construction of two vermiculite processing plants in the encampment area is expected next spring. The plants will be used to process the mineral for use in construction projects. He further indicated that negotiations were in progress for construction of a wool plant.

NEW SAWMILL AT ALBANY—Ole Alexander, one of the Medicine Bow timber operators, is planning construction of a new sawmill at Albany, which will increase Wyoming's timber industry to about a million and a half board feet. Alexander expects to provide year around work for employees of the Midland Fuel and Timber Company.

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WESTERNERS AT WORK

Arizona

Walter G. Willson, Los Angeles sales manager for Westinghouse Electric Corp., transferred to Phoenix in the same capacity.

California

George R. Langlois, formerly N.A.M. San Francisco manager, and more recently vice president in charge of sales for R. I. Bentley Co., advanced to executive vice president of Bentley Co., with San Jose headquarters.

Victor B. Peterson named salesmanager for Sun Garden Packing Co., San Jose. **William L. Battaglia,** who formerly held that position, becomes general manager.

Newcomb D. Taylor and **B. H. Desser** elected assistant secretaries of Hancock Oil Co., Long Beach.

Perry L. Francis, formerly general manager of sales for Alan Wood Steel Co., Conshohocken, Pennsylvania, elected vice president in charge of sales. Francis joined Alan Wood sales organization in 1924, and served the company in San Francisco, Seattle, and Los Angeles.

H. A. Lang named Southern California district manager for Pacific Coast Paper Mills, with headquarters in Los Angeles. Lang comes to this position from Carnation Milk, for whom he was western sales manager of their evaporated milk division.

F. M. Rich, vice president in charge of Kaiser Company operations at Fontana, is transferred to the Oakland office of Kaiser Steel Co., where he will continue to be responsible for all manufacturing and mining operations of the company.

Hank Manker is promoted to general manager of Plomb Tool Co.

J. T. Deane, vice president of Oronite Chemical Co., moves to San Francisco from New Orleans, to take charge of all Oronite manufacturing operations. **T. I. Clausen,** acting assistant to the manager, Chemicals division, at California Research Corp., another subsidiary of Standard of California, is transferred to Oronite.

H. Ward Butterfield named general manager of sales for Norris Stamping & Manufacturing Company.

C. C. Gibson appointed executive vice-president of Paraffine Companies, Inc., San Francisco, succeeding **R. H. Shainwald,** who retires from active service.

Raymond L. Geiler appointed president of the A. R. Maas Chemical Company, South Gate, California, to succeed the late **Holger Stougaard. Thomas F. Edson** elected to succeed Geiler as executive vice president, and **Fred C. Bowman,** director of research, appointed vice president.

E. E. Binger, formerly director of industrial relations for Solar Aircraft at San Diego, becomes general manager of industrial relations for San Diego and Des Moines. **Wally H. Marrow** promoted from general foreman of tool manufacturing to superintendent of tool manufacturing, at San Diego.

George M. Taylor appointed secretary of the newly-formed Oakland Development Council, joint civic-business-labor program for community development.

Alex W. Davis elected secretary of Gladding, McBean & Co., succeeding **William P. Wood. J. W. Mahoney** elected a vice president.

Frank Clelland Jr. appointed research associate on the electrical engineering staff of Stanford Research Institute.

Donald S. Grubbs becomes manager of the California division of Oil Well Supply Co. at Los Angeles. **Warner F. Parker** named sales manager of the division.

Ewart M. Parum appointed forest engineer for Masonite Corporation. Parum will have charge of the operation of the truck logging road which Masonite is building between the plant and the company's timber lands west of Ukiah. Further, he will direct Masonite's logging operations on its own lands.

John J. Stanko appointed manager of Douglas Oil Co. of California's processing asphalt division.

E. A. Commins appointed vice president, and **John Joesten** named assistant secretary of Stuart Oxygen Co., at San Francisco. They have been associated with the firm for more than 20 years.

B. P. Bohannon becomes manager of Administrative department for Western region of Ford Motor Co., replacing **Ivor de Kirby,** who was transferred to Long Beach, Calif. district as assistant sales manager.

John Hood, manager of General Electric Co.'s Oakland apparatus department, retired, succeeded by **Ab Martin,** who has been assistant manager.

Sam Naman, of Fresno, appointed general sales manager for Valley Motor Lines and Valley Express Co. Naman has been director of public relations for Valley Lines.

Ambrose J. Seitz, vice president of traffic for Union Pacific R. R., elected executive vice president. **William T. Burns,** general freight traffic manager succeeds Seitz.

L. F. Harman assigned as staff assistant to **Oliver P. Echols,** chairman of the board of Northrop Aircraft, Inc., Hawthorne, Calif. Harman has been Northrop's Dayton (Ohio) representative for the past two years.

Beverley Holmes promoted from purchasing agent to plant manager for National Motor Bearing Co., Redwood City. **Ellsworth Johnson, Jr.,** chief inspector, named to succeed him.

R. C. Sebol becomes director of engineering at Consolidated Vultee Aircraft Corp., San Diego. This is a new position created to coordinate interchange of engineering activities at San Diego and Fort Worth (Texas) plants, which employ 1,700 engineers.

T. C. Ingersoll appointed general manager of the Pacific coast district of Bethlehem Steel Company's shipbuilding division, including San Francisco, Alameda, and San Pedro yards. Ingersoll will continue as manager of the San Francisco yard. In his new position, he succeeds **W. M. Laughton,** retired from active service but continuing with the firm in a consulting capacity.

George N. Hawley promoted from industrial sales manager to sales manager for Southern California Edison Co.

W. J. Bailey, Jr., appointed vice president in charge of West coast operations for Affiliated Gas Equipment, Inc., Los Angeles, and general manager of Payne Furnace Co., a Beverly Hills division. **C. F. Cushing** named assistant general manager in addition to his present duties as director of sales.

Kenneth L. Brownell named by Diamond Match Co. as superintendent of all retail lumber yards and building supply stores in California. **C. August Silberstein,** manager of Dunsmuir yard, named sales estimator.

George L. Dealey, formerly with Herrick Iron Works, made vice president and director of sales for Barrett & Hilp, San Francisco.

Leonard Formosa transferred from Washington, D. C., to Los Angeles, to become district manager in that area for Williams, Dimond & Co. He replaces **Stafford S. Harlow,** retired. Williams, Dimond & Co. are Pacific coast agents for American-Hawaiian Steamship Co.

Safway Steel Products, Inc., Chicago, has purchased the Safway Steel Scaffolds Co. of California and the Beatty Safway Steel Scaffolds Co. of California, both Los Angeles firms.

L. R. Kessler becomes vice president of Owens-Corning Fiberglas Corp., and general manager of the Pacific coast division with headquarters at the Santa Clara Fiberglas plant. **W. C. Winterhalter** named vice president and sales manager of the Pacific coast division with headquarters in Los Angeles. **Leland S. Connick,** with the firm since 1922, advanced to position of assistant general sales manager of the Pacific coast division.

Henry O. Golightly and **Hiel C. Pugh** join McKinsey & Co., San Francisco, as consultants in personnel management and labor relations field. Golightly was formerly with Rheem Manufacturing Co. as general personnel manager; Pugh comes from Emerson Electric Manufacturing Co., St. Louis, and the Vendo Co., Kansas City, Mo., for whom he was director of personnel.

Woodworth B. Clum resigns as president of Pacific Press, Inc., Los Angeles, succeeded by **John D. Taylor,** who is president of J. W. Clement Co. of Buffalo, New York. Clement company has acquired control of Pacific Press, but Clum will remain as a director.

W. Kenneth Varcoe, 25 years with American President Lines, becomes vice president in charge of freight traffic. **H. Boyce Luckett** named assistant vice president in freight-traffic. **William H. Sharon** takes over duties of executive assistant to the president, position made vacant by Luckett's promotion.

Baxter F. Ball, manager of the Northern California division of General Petroleum Co., marketing department, appointed assistant to the director of marketing, succeeding **Charles H. Wartman,** who becomes manager of the marketing department.

William G. Pocock named sales and promotion manager for Kuster Laboratories, Inc., San Francisco food and biological products manufacturing firm.

A. J. Ryken, 20 years with American President Lines, appointed freight sales manager of the Pacific coast division. **Volney F. Grace,** formerly with Encinal Terminals, joins APL as assistant freight sales manager of the Pacific coast division.

G. T. Murdock Co. of Detroit, and **Gerald T. Murdock Co., Ltd.,** of Windsor, Ontario, has been named traffic agents for American Mail Line.

William H. Yost appointed operations manager of Isthmian Steamship Co., succeeding the late **George L. Lilly.** Yost has been assistant operating manager on the Pacific coast.

P. A. Malling, of the Osborn Manufacturing Co., Cleveland, Ohio, transferred from the New Jersey area to the West coast, with headquarters in San Francisco and Los Angeles.

J. W. Fairbanks assumes post of Western division manager for Electric Auto-Lite Co., Toledo, Ohio, with Los Angeles headquarters. He succeeds **D. M. Skirving.**

Calvin D. Wood, former president of Wood & Grace advertising agency, affiliates with Chris Lykke & Associates, San Francisco advertising and public relations firm. Wood will direct the firm's advertising.

O. F. Van Beveren appointed northern district exploration superintendent by Standard Oil Company of California, with headquarters at Bakersfield. He has been geophysical supervisor for Standard since 1946.

J. D. Potter advanced to assistant treasurer of Columbia Steel Co., a USS subsidiary. Potter will remain at the Los Angeles office, where he has been credit representative for the southern district.

Robert H. Ausfahl, a senior analyst in Standard Oil of California's department on Organization, has received one of the ten Sloan Fellowships for a year's study at M. I. T., to study management, economic and social problems of industrial administration.

Matson Navigation formally establishes an Accident Prevention section, and names **Melvin Anderson** to direct it. By this move, the Matson Navigation Company becomes probably the first Pacific coast steamship company to employ an experienced safety engineer on a full time basis.

Stanley M. Johns, manager of Westinghouse Electric Corp.'s Salt Lake City office, named manager for Westinghouse in their southern California area. He succeeds **Walter G. Willson,** who has requested transfer to Phoenix, Ariz., because of his health.

Allen R. Binckes becomes district sales manager for Whiting Corporation, in the Pacific coast area, with office at 5649 Alhambra Ave., Los Angeles. **Harold Overman** becomes his assistant.

Earl Prentice rejoins Atlas Brass Foundry, Los Angeles. At present he is making a sales and engineering survey of southwestern states.

David Silverman named assistant general manager of the Oakland chamber of commerce.

Stauffer CHEMICALS SINCE 1885

Fleets of Stauffer tank trucks are now available to deliver industrial acids in bulk in California and the Pacific Northwest.

Bulk deliveries save on initial cost of commodities, lower freight charges, lower cost of handling, and elimination of lost time accidents through careless handling of drums or carboys. The Stauffer Chemical Company has pioneered the tank truck method of bulk delivery on the Coast.

You don't need spur track facilities to avail yourself of tank car savings on sulphuric, muriatic, or nitric acids or other liquid chemicals. By converting to a bulk system, the Stauffer-owned fleet of tank trucks can put money in your pockets *wherever* you may be located.

Stauffer field men will be happy to work with you in your plant on planning how a bulk system can be installed.

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Colorado

H. P. Morgan, 21 years with United Air Lines, appointed superintendent of communications for ground services, with headquarters at the airline's Denver operating base, Stapleton Field.

Idaho

H. E. Baker, district power superintendent in the Lewiston area, retires from the Washington Water Power company after 37 years of service in the field.

Oregon

Philip F. Thayer appointed general manager of Willamette Iron & Steel Corp., Portland, succeeding **G. W. Wintz,** who is being transferred to the main office of Guy F. Atkinson Co., parent organization of W. I. & S. Corp. **Donald J. Kooker** is named assistant manager of Willamette. Kooker was formerly with Rheem at Chicago. **Dwight Richards,** formerly chief engineer with Buda Mfg. Co. in Chicago, is also joining Willamette as chief engineer. **Robert R. Schultz,** formerly sales manager for the industrial division of Nordberg Mfg. Co. in Milwaukee, becomes sales manager.

L. D. Houghton becomes manager of North Plywood, Inc., Eugene, succeeding **Roy St. Dennis.**

Utah

Edward H. Snyder elected president of the American Zinc Institute. Snyder, also president of Combined Metals Reduction Company, Salt Lake City, succeeds Howard I. Young as head of the Zinc Institute, who is retiring after 31 years with the organization.

O. W. Tuckwood elected vice president in charge of traffic for American Smelting and Refining Co. For the past seven years he has been general traffic manager for the firm.

Fred Tedesco, Salt Lake City commissioner, resigns his city position as of June 15, to become general manager of Canada Dry Bottling Co. of Utah.

W. J. O'Connor retires as general manager of the Utah department of American Smelting and Refining Co. He is succeeded by **R. D. Bradford** of the San Francisco, California offices.

At a recent meeting of **Utah Southern Oil Co.,** all officers and directors were reelected.

Northwest Frozen Foods Assn.: president, **Arthur E. Symons,** Hershey Packing Co.; vice-president, **Arthur L. Reiling,** Birdseye-Snyder; secretary-treas. (re-elected), **Edgar M. Burns.**

H. B. Hodgins, Westinghouse manager at Spokane, Wash., transferred to Salt Lake City office as manager of sales activities in that area.

Washington

Carroll G. Holloway, formerly purchasing agent for Isaacson Iron Works, Seattle, joins Lawrence - Totten Co. as manager of their Seattle office, succeeding **W. R. Lindersmith,** resigned. Holloway, a past president of Washington State Purchasing Agents Association, will cover the states of Washington and Oregon in the interest of the following principals: Bliss & Laughlin, cold finished bars; Lewis Bolt & Nut Co., bolts and nuts; Standard Tube Co., electric welded carbon and stainless steel tubing; Inland 4-way Floor Plate, produced by Inland Steel Co., Chicago.

Robert E. Blasen appointed sales manager for Westinghouse Electric at Spokane, succeeding **H. B. Hodgins,** transferred to Salt Lake City.

Clarence Roessl joins Pacific Plastics Co. at Renton as chief engineer. He makes available to Pacific Plastics his extensive background of mechanical engineering which includes association with Quaker Oats Co., Boeing Airplane Co., University of Washington, and Pacific Car & Foundry Co.

E. Ralph Edgerton, Spokane insurance man, retires after 18 years continuous service as chairman of the Timber Products Bureau of the Spokane Chamber of Commerce.

Gilbert L. Manor, oldest employee in active service with Washington Water Power Company, retires after 45 years of employment with the firm.

Wyoming

V. H. Kruse assumes position of manager of all IBM sales and services in the Cheyenne area, being transferred from sales representative's spot in Sioux City.

Associations Elect

New Organization—Association of Sprinkler Irrigation Equipment Manufacturers has been formed, with headquarters in Ridgewood, New Jersey. **Everett H. Davis,** Irrigation Equipment Co., Eugene, Oregon, elected president.

Furniture Manufacturers' Assn. of Los Angeles: Edward Meltzer, secretary-treasurer of L. A. Period Furniture Manufacturing Co., president; Paul G. Schmitz, Bailey-Schmitz, vice-president; A. S. Sandberg, Sandberg Furniture Co., treasurer.

Intermountain Logging Conference: Robert W. Olin, Potlatch Forests, Inc., Lewiston, Idaho, president; Warren H. Brown, Brown's Tie & Lumber Co., McCall, Idaho, vice-president; O. B. Calvin, Somers Lumber Co., Somers, Montana, treasurer.

Idaho State Chamber of Commerce: Paul V. Nash, secretary of the Nampa C. of C. and for 18 years secretary of Pocatello C. of C., becomes assistant secretary. H. A. Elcock, Twin Falls, district manager for Amalgamated Sugar, reelected president; Windsor J. Lloyd, Nampa, vice president; Harry W. Marsh, Boise, treasurer; Earl W. Murphy, secretary.

Northwest Wood Products Clinic: John H. Leuthold of Deer Park Industry, Inc., Deer Park, Washington, president; R. O. Batdorf, field engineer, Washington State Institute of Technology, Industrial Services, Washington State College, secretary; John Timm, Idaho Pole Co., Sandpoint, Idaho, treasurer.

Society of the Plastics Industry: Herbert G. Pratt, American Cyanamid Co., Los Angeles, chairman; Ferdinand T. Kebely, K-Plastix, San Francisco, vice chairman; Lee T. Bordner, McDonald Mfg. Co., Los Angeles, secretary-treasurer. Other officers were elected without opposition.

Canners League of California: Normal L. Waggoner, Santa Clara Packing Co., president; other officers reelected.

Timber Products Manufacturing Assn.: A. L. Helmer, Polson, Montana, president; J. H. Leuthold, Deer Park, Washington, vice president; L. P. Pugh, St. Maries, Idaho, treasurer. George J. Tichy, Spokane, renamed manager-secretary.

California Wine Institute: Harry Baccigalupi, San Francisco and Delano wine grower, reelected for his third term as president; John Daniel, Jr., Rutherford, first vice president; Louis Petri, San Francisco, second vice president; James K. Herbert, Fresno, third vice president; Jame L. Vai, Cucamonga, treasurer; H. A. Caddow, San Francisco, secretary-manager.

American Petroleum Institute welcomes four West coast oilmen to their committee on national oil policy: H. D. Collier, Standard Oil Co. of California; W. F. Humphrey, Tide Water Associated Oil Co.; A. C. Mattei, Honolulu Oil Corp.; Reese H. Taylor, Union Oil Co. of California.

Columbia Basin Sawmills: Henry J. Leaf, Inman-Poulsen Lumber Co., president; Lewis H. Mills, Trask Lumber Co., vice president; Carl G. Bock, Multnomah Lumber & Box Sales Co., secretary-treasurer; Charles E. Castle, Oceanside Lumber Co. reelected assistant secretary-treasurer.

Rocky Mountain Empire Synthetic Fuel Assn.: A. J. Merritt, president of Walsenburg Coal Co., president; Lee Knack, Pueblo, first vice president; Eddie Cribbs, Florence, second vice president; Jack Lacey, manager and secretary of Pueblo chamber of commerce, secretary-treasurer.

Association of Washington Industries: Arnold Polson, Grays Harbor, reelected president; Ralph M. Robert, Bellingham, vice president; J. B. Power, Vancouver, vice president; Henry L. Coffin, Yakima, vice president; Neal R. Fosseen, Spokane, vice president; Corydon Wagner, Tacoma, vice president; Ed Davis reelected secretary.

Oil Producers Agency of California: L. A. Cranson, Honolulu Oil Corp., San Francisco, reelected president; H. E. Woodworth, Safe Oil Co., Bakersfield, first vice president; R. A. Grant, Fullerton Oil Co., Los Angeles, second vice president; W. H. Geis, Los Angeles, third vice president; C. A. Johnson, Holly Oil Co., Los Angeles, fourth vice president; Rush M. Blodget, executive vice president; W. A. Russell, Seaboard Oil Co., secretary-treasurer; Verne Harrell, Bankline Oil Co., assistant secretary-treasurer.

California Stripper Well Assn.: Victor L. Norman reelected president; Edwin P. Crail and Laurence A. Donnelly reelected vice presidents; Decatur Mitchell elected a vice president.

American Council of Commercial Laboratories, Western division; Roger W. Truesdail, Truesdail Laboratories, Inc., Los Angeles, chairman; Herbert D. Imrie, Abbot A. Hanks, Inc., San Francisco, vice chairman; E. O. Slater, Smith-Emery Company, San Francisco, secretary.

National Association of Refrigerated Warehouses elected recently, among four new members, G. F. Dodson, president of Security Warehouse and Cold Storage Co., San Jose, who will represent the South Pacific chapter.

Mountain States Employers Council: Elmer H. Peterson, Rio Grande Fuel Co., elected president; Brown W. Cannon, Beatrice Creamery Co., vice president; Palmer L. Burch, H. W. Bennett & Co., treasurer; James P. Logan, managing director of the Mountain States Employers Council, secretary.

Aircraft Industries Association: Admiral DeWitt C. Ramsey, retiring C. in C. of the Pacific fleet, U.S.N., president.

Water Distilled At 6000 Gallons per Hour

THE largest water distillation unit of its type in the world, capable of processing 6,000 gallons an hour, has been placed in operation at Arrowhead and Puritas Waters, Inc., Los Angeles.

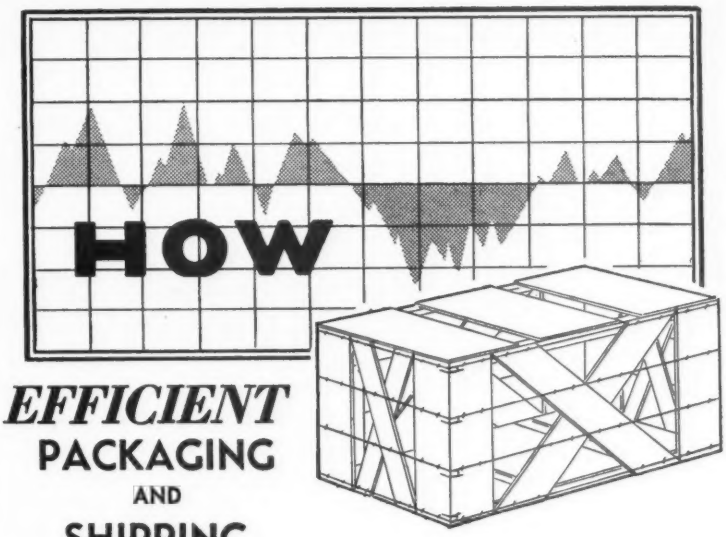
As the operation commences, untreated water is passed through a water softener and then enters piping that is in contact with the already-processed water leaving the system to be bottled. The heat of the distilled water leaving the system is transmitted to the cold water entering the system, by means of a heat exchanger, its temperature rising to near the boiling point as it reaches the evaporator.

The evaporator is situated in a large tank holding 1,375 copper tubes which maintain the water temperature at approximately 220° by a constant blast of steam introduced into the tank under six pounds pressure. As this steam hits the copper tubes, the already near-boiling water is quickly brought to a boil and emits quantities of more steam.

This new steam is routed through more piping to a blower, operated by an electric motor, turning at 7,700 rpm., which quickly builds the new steam to six pounds pressure and forces it back against the same copper tubes from where it originated. More steam is generated, resulting in a continuing process.

When the steam is forced against the copper tubes, it is cooled sufficiently to cause some condensation, which is trapped in return piping in the form of distilled water. While this condensation continues, carbon dioxide is trapped and released from the system.

The "brains" of these units is an elaborate control board. After the distilling process, ozone is bubbled through the water. This distillation unit was designed by Cleaver-Brooks Company of Milwaukee, and was installed by Humiston Rosendahl of Los Angeles.



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1 EFFECTS ECONOMY OF INITIAL PURCHASE.

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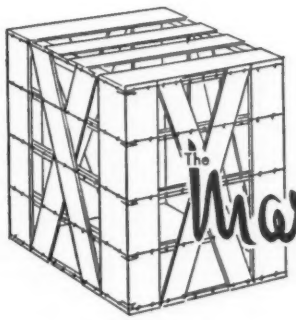

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Plants located at Oakland, Oregon, and Whittier, California

Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

Republic Supply Company Expands

Over 5,000 oil and industrial leaders from all over California attended the recent three-day open house in the new, ultra-modern headquarters of The Republic Steel Company of California, at Los Angeles.

Each guest received a 12 page, illustrated brochure, tracing the history and growth of the 32 year old company and showing the improved service that the new facilities would provide.

Highlight of the open house was an informal tour through the 23,000 square foot office and the 90,000 square foot warehouse. An attractive buffet luncheon was served in the warehouse, where several of Republic's manufacturers had full size, animated displays, featuring the latest in oil well and industrial equipment and supplies.

Pictures at top are: left, Charles Schriber, vice president of Republic, Southern Division; right, Jack Pike, Republic Supply Company president. Center, the Lunkenheimer Company's staff at the affair included Ed Johnson, San Francisco factory representative, at the left; Ebby Lunken, vice president, center; and Carl Rosser, Los Angeles factory representative, right. At bottom is a view of Republic's new headquarters. Inset is P. M. Pike, founder of the firm.

American Monorail Company has closed its Hollydale office and warehouse at 12311 Industrial Avenue, and turned over distribution of the entire line of overhead handling equipment to **the Irving King Co.**, 821 Mateo St., Los Angeles. **Gordon P. Kautz,** sales engineer formerly connected with American Monorail in Cleveland, Ohio, will be in charge of the new operations.

A. B. Boyd Co., West coast representatives for American Felt Co., announce the recent addition to their staff of **Eric Johnson,** who will represent them in southern California, Arizona, and New Mexico.

Utilities Supply Co., 1736 E. 15th St., Los Angeles, have purchased their present site and an equal space adjoining, which doubles their floor space. Additional facilities will relieve the present crowded warehouse condition and permit expansion of activities and services.

Idaho Steel Products Co., Inc., Boise, Idaho, appointed distributor of Reynolds aluminum mill products for the Idaho territory. Company address is P. O. Box 2817, Boise. They will handle Reynolds aluminum flat sheet, coils, wire, rod, bar, structurals, tubing, and standard extruded architectural shapes.

C. H. Hart appointed in charge of Gould Storage Battery Corp.'s new regional office for sales and service engineering, at 444 Market St., San Francisco.

M. Lerman Co., Oakland, awarded the first franchise for distribution of Birely's bottled beverages in the San Francisco area.

Dole Sales Co., a new sales unit of Hawaiian Pineapple Co., Ltd., will handle distribution of all products manufactured by Hawaiian Pineapple and its two associated companies, Barron-Gray Packing Co., San Jose, and Delemex, S. A., Vera Cruz, Mexico.

Frank A. Tsortz, Jr. appointed traffic appliance sales manager for the San Francisco district of General Electric Supply Corporation. He succeeds **V. L. Hobson,** who becomes manager of the appliance sales in the firm's Seattle district.

M. E. Canfield Co., Los Angeles, appointed southern California distributors for John Cavanaugh Co., Los Angeles. Stocks of the line of furniture and light duty industrial casters will be maintained in Canfield's warehouse to supply immediate needs.

Karl Moellendick, Los Angeles, representative for Ready Power Co. in California, Arizona, Utah, and Nevada, announces incorporation. The firm is now known as **Karl Moellendick, Inc.,** with father and son as president and vice president, respectively.

Air Mack Equipment Co. of Seattle and Portland have become stocking distributors of Faultless industrial casters, and will carry a complete line at both locations.

Industrial Supply Co., Salt Lake City, appointed distributor for Faultless Caster Corp., and will carry a full line of industrial truck casters.

E. C. Buehrer Associates, San Francisco, recently appointed exclusive northern California distributors for the Economy Engineering Co.'s line of portable elevating tables, and portable telescopic utility ladders.

Slaybaugh-Thompson Co., Denver, now represents General Switch Corp. of Brooklyn, New York, in Colorado, Utah and Wyoming.

Link Belt Co. moved their Spokane, Wash. quarters to North 1303 Washington St., Spokane 13.

William Skinner & Sons, New York textile manufacturing firm, open sales offices at 821 Market St., San Francisco, with **Jack Koepfinger** representing.

Westinghouse Electric Corporation establish offices in Walla Walla, Washington, and appoint **Douglas P. Gunn, Jr.**, of Portland, sales representative in charge.

Montague-Harris & Co. name **A. J. Levine,** 703½ J St., Sacramento, representative in Sacramento-San Joaquin Valley area; **S. O. Otrich,** P. O. Box 1041, Carmel, becomes Monterey-Salinas district representative.

Norpac, Inc., distributors of aluminum building materials, have taken over quarters at 1520 S. E. 11th St., Portland, Oregon, to center operations in the Oregon, southwestern Washingon, and eastern Idaho territory.

Cate Equipment Co. appointed exclusive agent for the distribution of surplus mine, mill and electrical equipment by Consolidated Coppermines Corp., Kimberly, Nevada.

Ceco Steel Products Corp., Chicago, appoint **H. G. Haake** manager in general charge of Ceco operations in all Pacific coast states, with Los Angeles headquarters. **W. F. Norton** appointed assistant district manager at Los Angeles.

W. J. Osborn appointed district manager for Hagan Corp. at San Francisco, succeeding **Clyde F. Williamson,** resigned. **Alfred Pittman** named marine manager of the San Francisco office, while **Douglas Barrett** will handle Hagan combustion control service in the stationary field.

George A. Spencer becomes head of American Nickeloid's Los Angeles sales office, with headquarters at 1323 Venice Blvd., Los Angeles 6.

John K. Waite named to handle Columbia River Packers Association products in Washington state.

C. E. Armstrong, vice president of King & Anderson, transferred from San Francisco to Los Angeles as branch manager, to replace **R. P. Anderson,** who resigned to open his own business in Dallas, Texas. This firm, West coast manufacturers representatives, will have sales in the Los Angeles area handled by **Fred Pelletier,** and the service department will be under **L. A. Rogers.**

Sterling Electric Motors, Inc., of Los Angeles, have opened a Northwest headquarters at 501 N. W. Park Ave., Portland.

Plant Insulation Co., 2120 East 25th St., Vernon, California, appointed distributors and contractors for **Cork Insulation Co., Inc.,** to handle corkboard, cork pipe covering, fitting and flange covers, machine insolation cork, composition cork sheet for gaskets, tack boards, novelties, re-granulated cork, fine and coarse.

E. S. Jones joins E. E. Richter & Son, Oakland, Calif. distributors for Wisconsin motors and Lipe-Rollaway clutches.

William S. Beal, formerly a paving contractor at Sanford, Maine, appointed sales engineer for Fornaciari Co. of Los Angeles.

Newman L. Smith elected president of Airquipment Co., Burbank, California, and Aerol Co., Inc.

Charles F. Hosford, Jr., and Raymond C. Whitman announce formation of **Nassau Chemicals, Inc.,** to serve as Western distributors of special chemicals and plastics. Offices are at 420 Market St., San Francisco.

New plant and warehouse of Rich Steel Co., at 2435 East 37th Street, Vernon, California, covers 16,000 square feet and includes a drive-through entry and exit for truck loading operations, and a rail spur and floor level loading dock, all under crane. Company will provide space for public storage of steel by manufacturers temporarily in need of it, in addition to supplying and maintaining the regular stocks and services.

William Smiley, formerly sales manager for Ducommun Metals & Supply Co., appointed sales representative for Ziegler Steel Service Co., Los Angeles, as were **Robert C. Brinkley,** formerly with Steel Service & Supply, and **James E. Callahan.**

M. J. Sutton, formerly of Airsupply Co., Los Angeles, establishes his own business at 1539 E. North Street, Grants Pass, Oregon. He will represent Flesfirm Products Co., Aircraft Die Cutters Co., Interchemical Corp., and U. B. Bray Co.

Fairbanks, Morse & Co. are now located at Soto and 46th Streets, Los Angeles, in their new plant.

Glenn A. Harshbarger, formerly southern California manager for the Frank E. Witte Co., announces establishment of his own business as manufacturers' representative in Los Angeles area for Baker Industrial Truck division of the Baker-Rauling Co., and the Moto-Truc Co., both manufacturers of battery-powered lift trucks. New firm name is Glenn A. Harshbarger Company.

Aro Equipment Corp. of Bryan, Ohio, appoints **Aro Sales & Service, Inc.,** as Pacific coast distributor, with headquarters at 2023 South Grand Ave., Los Angeles 7. The San Francisco office is at 766 Brannan St., and sales and service for the Pacific northwest will be handled by the Prattco Sales Co., at 714 Fourth Ave., Seattle, Washington.

Mall Tool Co. erects two new buildings at 2735 San Pablo Ave., Berkeley, and 440 E. Alosta Ave., Glendora, to provide salesrooms, a complete display, and full stock of portable power tools for the convenience of customers and dealers.

Allis-Chalmers names the following Western dealers: **Pima Electric Co.,** Tucson, Arizona, for the firm's motors and controls; **Copper Electric Co., Inc.,** Bisbee, Arizona, for motors, controls, and transformers; **Barney Machine Works,** Prineville, Oregon, for motors, controls, Texrope drive equipment, and centrifugal pumps.

Salisbury Corporation, Los Angeles, manufacturers of a line of industrial gasoline-powered material handling trucks, appoint **Preston Faller,** of Seattle, Washington, distributor to handle business in Washington, Oregon, Idaho, and British Columbia.

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A Great Variety of Standard Types

Save lost time, eliminate bottlenecks and wasted motions—increase production capacity by streamlining handling of material with the type of Nutting Trucks suited to your work. For quicker delivery a great variety of standard types are available—also rubber tired wheels and casters of all sizes for any truck.

FIG. 1136. Non-Tilting Bar Handle Truck, 6 platform sizes. Capacity 2500-3000 lbs. Semi-Steel or Rubber-Tired Wheels.

Look in your classified phone directory for your local Nutting representative listed below, or write us.

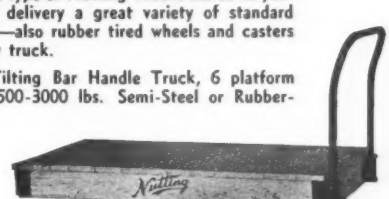

Fig. 1136

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Mechanical KINKS

Pump Problems Now Simplified

By W. F. SCHAPHORST, M.E.
Former Engineering Instructor
New Mexico State College

This chart simplifies pump problems. It answers these questions:

What is the Efficiency of the Pump?
What is the Head?
How Many Gallons Per Minute Will It Pump?
What is the Horse Power?

Here is a chart that will be appreciated by many a reader for finding the horse power necessary to do almost any pumping job up to 100 h.p.; for finding the number of gallons of water a given pump will lift per minute; for finding the head; or for finding the efficiency of a given installation.

An Example

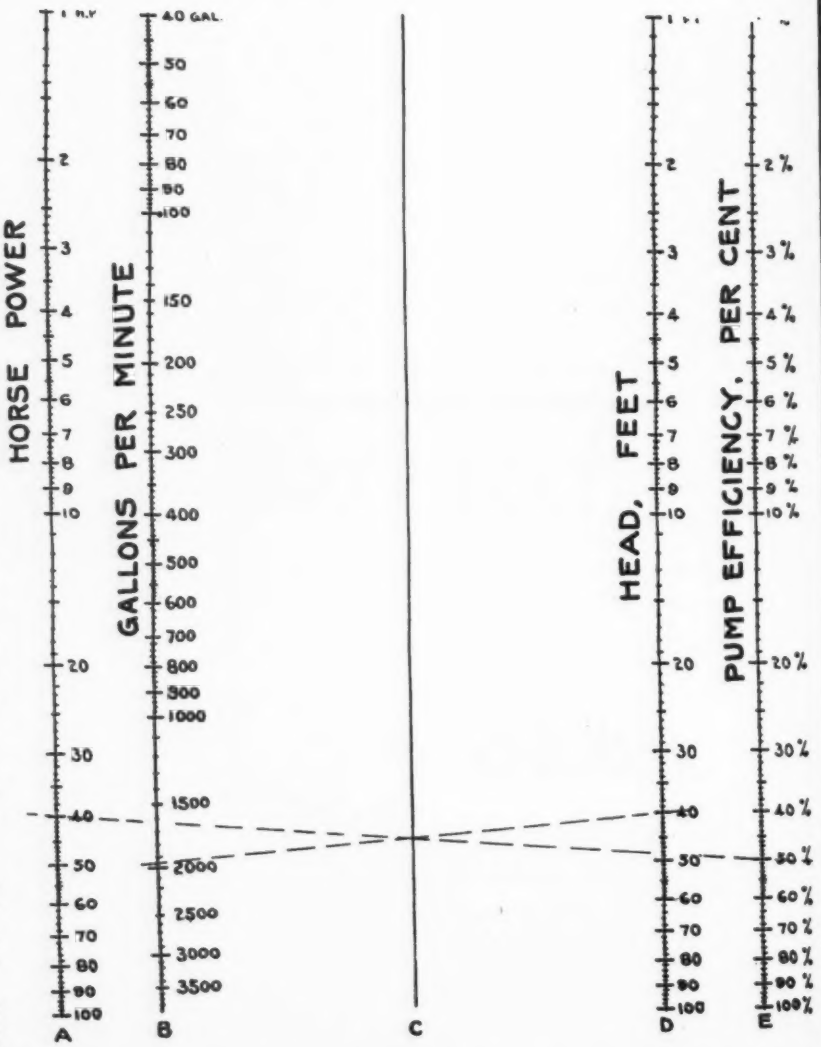
As an example, how many gallons per minute will be pumped by a 40 h.p. motor through a 40 ft. head, the efficiency of the pump being 50 per cent? Join the 40 in column A with the 50 per cent in column E and locate the intersection with column C. Then run a straight line through that intersection in column C and the 40 ft. head in column D and the answer (1,950 gallons per minute) is instantly found in column B.

The principal point to remember is: always connect A and E; B and D. That is, the two outside columns must be used together, and B and D must be used together.

It is plain, now, that if you know three of the values in A, B, D, or E, the fourth one is easily and quickly found without any pencil figuring.

Whether the motive power is electric, steam, gas, oil, belt, water, or what not, makes no difference. And it doesn't matter about the pump either—whether duplex, triplex, reciprocating, steam, centrifugal, or air lift.

When figuring efficiencies allow about 80 per cent for duplex, triplex, and reciprocating pumps in general; for a good modern centrifugal pump about 70 per cent; and for air lift pumps 40 per cent is considered good. Higher efficiencies than these have been and are being attained with all of the above pumps, to be sure. If you know the exact efficiency of your pump or the one you have in mind, so much the better. That is the efficiency to use in this chart, of course.



By being careful this same chart can also be used for pumps of larger sizes. Thus for instance the identical dotted lines would tell us that a 400 h.p. motor will lift 19,-40 ft. and at the same efficiency of 50 per cent. Thus if you add a cipher in column A you must also add a cipher to the figures in 500 gallons per minute against a head of one of the balancing columns. Use the chart a while and you will soon be able to apply it to a surprisingly wide range of pumping problems.

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307 Water St. WEST BEND, WIS.

How Much Fuel Does A Diesel Use— At Full Load? Half Load? Quarter Load?

There is not much information available on the amount of fuel consumed by diesels at fractional loads. Salesmen like to tell us the "best" figures, but not the poorest.

The questions in the above title are important and should not be "side-stepped" by salesmen who are afraid of committing themselves. Many of them reply, "It all depends upon the size required," or words to that effect and the prospective user is mystified by the intricacies of the situation. As a result the prospect becomes "afraid" of diesels and doesn't buy.

This writer has therefore made an effort to answer the above questions definitely. He has gathered data on fuel consumption by modern diesels of numerous sizes and has prepared the following table. This tells at a glance what good diesels are doing today, the horse power varying from the smallest sizes up to and including 3000 h.p. The table applies to full load conditions.

Horse Power of Diesels	*Pounds of Fuel Used Per H.P. Per Hour*
50-60	0.45 to 0.44
60-70	0.44 to 0.43
70-110	0.43-to 0.42
110-260	0.42 to 0.41
260-500	0.41 to 0.40
500-1000	0.40 to 0.392
1000-2000	0.392 to 0.391
2000-3000	0.391 to 0.390
3000-and up	Slightly less than 0.39

Thus for instance if your requirements are very small—50 h.p. or even less—you can figure on a fuel consumption of 0.45 lb. per h.p. per hour with a modern engine. If you need a 100 h.p. diesel the consumption will be about 0.42 lb. per h.p. hour. The table shows that with increase in engine size the fuel consumption improves rapidly from the smallest sizes to 260 h.p. From 260 to 1000 h.p. the improvement is less rapid, and from 1000 to 3000 horse power the improvement is very slight being practically 0.39 lb. per h.p. for all of the sizes in that range as well as for larger sizes.

Should you want to determine the efficiency of any engine size with any fuel, multiply the B.T.U. value of the fuel per pound by the number of pounds per h.p. and divide the product into 2546.

As an example, if the fuel contains 20,000 B.T.U. per pound and you will require a 500 h.p. engine, the table shows that you must multiply 20,000 by 0.40, which gives 8,000 as the product. Now divide 2546 by 8000 and it will be found that the engine will have an efficiency of 31.8 per cent, which is a high efficiency as compared with most engines of other types. It means that 31.8 per cent of the heat contained in the fuel will be converted into work. Even at 0.45 lb. of fuel per h.p. per hour, other conditions being

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235 Mission St., San Francisco 5

the same, the efficiency will be 28.3 per cent, which is *high* efficiency for any engine.

Fractional Loads

The above figures relate solely to diesels that are carrying 100 per cent load, which means that conditions are best for minimum fuel consumption. However, since diesel engines are commonly operated at less than full load, it is also important that prospective users should know what the fuel consumption at such loads will be. This information should be known in advance.

Under average conditions, using the *good* diesels mentioned above, the writer offers the following figures as being applicable.

Per Cent of Load	*Multiply Figures in Above Table by*
100 to 85%	1.000
85 to 70	1.010
70 to 62	1.035
62 to 56	1.060
56 to 52	1.085
52 to 48	1.110
48 to 46	1.136
46 to 44	1.160
44 to 42	1.183
42 to 40	1.210
40 to 38	1.232
38 to 36	1,260
35%	1.306
34	1.327
33	1.348
32	1.370
31	1.392
30	1.415
29	1.438
28	1.462
27	1.486
26	1.511
25	1.536

Thus for example if you should be contemplating a 100 h.p. diesel, and if it is quite possible that the engine will be operating at 25 per cent of full load most of the time, as is not at all uncommon in practice, the fuel consumption at that load is obtained by multiplying the 0.42 in the first table by the 1.536 in the second table. As a result we have:

$$0.42 \times 1.536 = 0.645$$

In other words, the fuel consumption will be approximately 0.645 of a pound per horse power per hour, or 16.1 pounds per hour for the engine while operating at 25 h.p.

Important Diesel Operation Pointers

On the whole the two details that are most important in the operation of a diesel engine are:

1. Lubrication, and,
2. Cooling water.

Although lubrication is the more important of the two, they are inter-related. Thus for instance the writer has in mind a diesel of well known make that was allowed to operate for a period of time that was too long with a cooling water temperature in the vicinity of 200 deg. F. If the cooling water had been distilled, or even conditioned, it wouldn't have been so serious, but this water was "bad;" it wasn't treated in any way.

Scale accumulations built up in the cooling jacket, of course, and clogged the passages. That led to high cylinder wall temperatures and the lubricating oil couldn't function properly. And that is where cooling water and lubrication are inter-related. The pistons stuck, scored the walls, and wore excessively.

Finally an "expert" was called, and it didn't take him long to put his finger on the cause of the trouble—the impure cooling water.

But going back to lubrication, have you ever noticed on reading through your diesel operating manual that lubrication is mentioned oftener than anything else? That, in a way, emphasizes its importance. Lubrication is what keeps the engine from wearing out quickly. All other conditions being right, lubrication is what permits the diesel to operate at its remarkably high efficiency year after year.

There is such a thing, too, as giving a diesel "too much" lubricant, believe it or not. It is well to be careful about that point although too much lubricant is better than too little. By giving the engine too much oil, carbon deposits will be formed. If such deposits persist in forming, don't blame the lubricating oil but blame yourself. The best way to oil a diesel is to use a force feed lubricator, feeding the oil directly onto the piston between the piston rings. Attach the lubricator to the engine and mechanize it in such a way that the amount of oil fed is in direct proportion to the number of strokes. Feed the oil against the piston while it is at the end of its stroke so that the oil will "catch" and so that it will not either blow out or be sucked out.

The color of lubricating oil has nothing to do with its capacity to lubricate. Therefore, don't be enticed into buying a "good-looking" oil simply for its looks. The lubrication problem is well worth studying carefully. Study both the lubricant and your engine and when the lubrication problem is once solved you will be pleased because of the small amount of attention the engine will demand of you. To flood an engine cylinder with oil may eliminate much of the friction, but on the other hand it may cause serious and costly trouble.

Where temperatures are low in buildings or out-or-doors, difficulty is often experienced in starting diesel engines. The reason why is, of course, the absence of electric or other spark for igniting the charge. The diesel engine is dependent on the temperature resulting from compression. Obviously, therefore, if the engine cylinder is cold it will absorb much of the heat from the compressed gas.

In order to ignite fuel oil the temperature must be as high as 800 to 1000 deg. F. The compression corresponding with those temperatures varies from 350 to 500 lb. per

Silicone News

DC SILICONES

DC 44 Silicone Grease Ends Bearing Failure in Textile Plant

Bearing failure may burn out your motors, stop your entire production line or ruin a mill run. That's why it's front page industrial news when the Plant Manager of a large textile plant reports that he has not had a single bearing failure since he started to use Dow Corning Silicone Oils and Greases over 30 months ago.

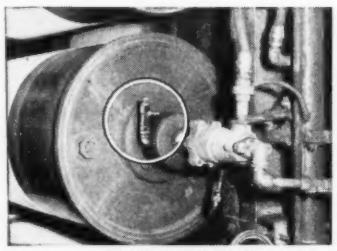

PHOTO COURTESY AMERICAN FINISHING COMPANY

DC 44 Silicone Grease in ball bearings on drying cans, operating at 400 r.p.m. around saturated steam journals, has 45 times the life of the organic grease previously used.

Typical of the lubrication problems that plague plant engineers in textile plants is the maintenance of "steam-heated" bearings. It used to be necessary to lubricate bearings on drying cans and the main cylinder bearings of Sanforizing machines once every 8-hour shift. Since American Finishing started to use DC 44, the re-lubrication schedule has been cut to once every 30 to 45 shifts. The lubrication of Slashers on textile mills presented a similar problem that has been solved by using DC 44.

On tenter frame chains and races that travel through ovens at 400°F., petroleum oils carbonized so rapidly that the chains had to be cleaned periodically. That costly operation and the need for continuous lubrication have been eliminated by a weekly application of DC 710R Silicone Fluid.

American Finishing, like many other skillfully engineered companies, has found that Dow Corning Silicone lubricants more than pay for themselves in reduced maintenance costs. Increased production due to the virtual elimination of bearing failure is another one of the many bonuses Dow Corning Silicones pay to modern industry. For the most recent data on DC Silicone Greases phone our nearest branch office or write for data sheet D5X5.

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sq. in. All of these things are more or less variable depending upon the kind of fuel, the original temperature of the fuel and air, the type of injector or atomizer, etc.

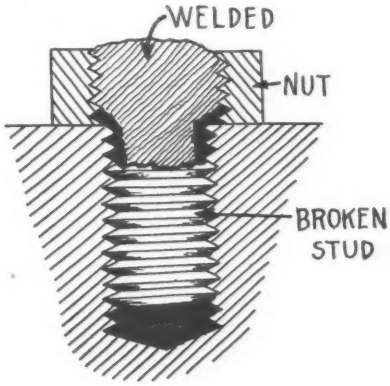
Present day diesels are equipped with mechanical starters. However, even mechanical starters sometimes have trouble and fail to start the diesel when weather is extremely cold. Under such conditions, if steam is available, an excellent aid to starting is to warm up the diesel cylinders by blowing steam into the water jackets and by preheating the fuel. Or, use a blast of hot air, or even hot water. Warmed-up cylinders will cause them to absorb less heat from the compressed gas and starting will be made decidedly easier.

A Handy and Valuable Welding Kink

Now that mechanics are rapidly equipping themselves with welding outfits of one kind or another this welding kink will prove of interest to many readers. It is a valuable and handy kink, showing how to remove one of those pesky broken studs—by welding process.

The accompanying sketch shows clearly how the job is performed—a method that is much simpler and better than the old time-consuming method of drilling, chipping, and digging. This method is well within the reach of every mechanic whose shop is equipped with electricity.

As shown in the sketch, place an amply large nut over the broken stud and build up the stud by welding onto it and then weld to the nut. In that way the broken stud and nut become one solid piece and the stud can be taken out with almost any kind of a wrench. The welding process also "helps" in that it heats the stud, causing expansion, and thus aids in loosening the threads so that the stud can be more easily removed.



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Fork Trucks

Title: "Material Handling Newsreel, Issue No. 3."
Subject: Fork trucks and their various specialized attachments in action in handling different types of loads.
Length: 14 minutes.
Supplementary Information: Black and white, sound projection only.
Available From: Advertising Department, Industrial Truck Division, Clark Equipment Company, Battle Creek, Mich.

Glass

Title: "Heritage of Glass."
Subject: The story of the manufacture of the various types of flat glass—plate glass, window glass, structural glass, safety glass, tempered glass.
Length: 28 minutes.
Supplementary Information: 16 mm. sound and Technicolor.
Available from: Libbey-Owens-Ford Glass Co., 635 Rialto Bldg., San Francisco 5, Calif.

Human Relations

Title: "Experiment."
Subject: Live action photography and cartoon study of basic factor of human relations—how people can't be "socked" into doing things, but will respond to a series of gentle pushes.
Length: 21 minutes.
Supplementary information: Sound motion picture; shipping weight, 5 pounds.
Available from: General Motors Corporation, 1526 Financial Center Building, 405 Montgomery Street, San Francisco 4, Calif.

Production

Title: "An American Miracle."
Subject: How mass production in industry operates, illustrated by showing basic steps involved in production of 3-inch shot.
Length: 18 minutes.
Supplementary Information: Sound motion picture; photography plus pictorial animation.
Available From: General Motors Corporation, 1526 Financial Center Building, 405 Montgomery St., San Francisco 4, Calif.

Heat

Title: "Heat—Where You Want It."
Subject: Applications of built-in electric heaters in heating of liquids, surfaces, process air, melting soft metals and heating pipelines.
Length: 25 minutes.
Supplementary information: 35-mm. black-and-white sound slidefilm, which comes complete with application data booklets covering the major uses of tubular, strip, and cartridge heaters in industry. $15.
Available from: General Electric Company, Schenectady 5, N. Y.

Arc Welding

Title: "The Inside of Atomic-Hydrogen Arc Welding."
Subject: In two parts: part one covers basic techniques of the process; part two shows more refined techniques.
Supplementary Information: 16 mm. full color film.
Available From: Visual Education Division, General Electric Company, Schenectady, N.Y.

Materials Handling

Title: "Modern Material Handling Methods."
Subject: Right and wrong ways of performing various operations involving fork trucks, including dock loading, pallet loading, warehousing.
Length: 17 minutes.
Supplementary information: Black and white, sound projection only.
Available from: Advertising Department, Industrial Truck Division, Clark Equipment Company, Battle Creek, Mich.

Tractors

Title: "Better Blading."
Subject: Manufacture of, and work capabilities of, the "Caterpillar" Diesel No. 12, No. 112 and 212 Motor Graders.
Length: 20 minutes.
Supplementary information: In full color.
Available from: Caterpillar Tractor Co., Peoria, Illinois.

Pipe Systems

Title: "Underground Arteries—The Story of Transite Pipe."
Subject: Pictorial explanation of a community water works system, and the use of Transite Pipe therein.
Length: 32 minutes.
Supplementary information: Full color sound motion picture.
Available from: Johns-Manville, 22 East 40 Street, New York 16, N. Y.

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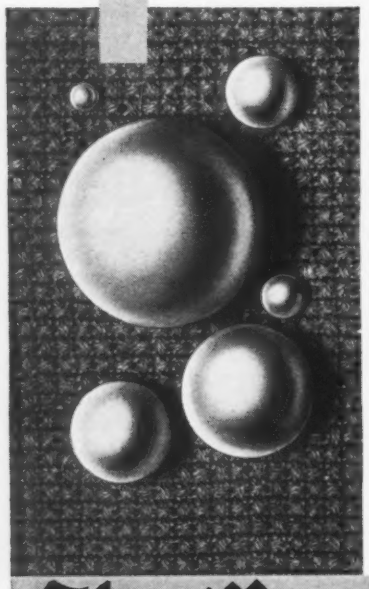

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**The Newest Wrinkle in Production*

Prefab Housing Folds

An Arizona venture into prefabricated housing has folded. Goodyear is closing its Wingfoot Homes subsidiary at Phoenix. The small, easily portable structures have not been able to get acceptance by local building codes, nor by banks and other financing agencies. Again house buyers are thinking in terms of their "dream homes" —another manifestation of the return to a buyer's market.

Unemployment has done much to bring pressure on the large amount of vacant housing offered for rent or sale here. Some owners, unable to sell, have finally decided to rent, while rates on the many control-free new apartments now being offered at $100 or more per month are gradually being shaded because tenants cannot be found to pay such prices.

Improvement in Wood

A super hardwood, cigarette-proof, alcohol-proof and with its natural wood grain intact, is the newest product of lumber industry research. The product, a compressed wood called Staypak, was perfected by the Western Pine Association Research Laboratory in Portland, Ore., and is now ready for commercial manufacture. The process has been made available to members of the association.

Staypak differs from other hardboards made of compressed wood fibers in that it is the result of compression of a whole board down to approximately one-third of its original thickness. The natural wood grain is retained and the board comes from the press with a natural high gloss. Water will remove the gloss but it can be maintained by clear-coating the board either before or after pressing.

Safety Conference

The eleventh annual Western Safety Conference will be held in Portland June 26-29 at the Multnomah Hotel, in conjunction with regional meetings of the Institute of Traffic Engineers and the American Society of Safety Engineers. Charles F. Bollinger, Room 282, Multnomah Hotel, is the conference manager.

Furniture Now Shipped In Wirebound Crates

Use of wirebound crates by the railroads has been authorized for shipping all items of furniture, including both metal and wood units, heretofore permitted in wooden crates.

Since shortly after the tests of January, 1948, permit to use wirebound crates for furniture items without freight charge penalties has been issued upon request by territorial Consolidated Freight Committees. With publication of Amendment No. 4 to Consolidated Freight Classification No. 18, however (which authorizes use of wirebound crates), such permits need no longer be sought so long as the wirebound crates used meet the specifications set forth under the amendment.

OPPORTUNITY SECTION

Safety Award For Fibreboard

Employees of the South Gate division Fibreboard Products, Inc., have been awarded the National Safety Council's Distinguished Service to Safety Award, consisting of a plaque and safety banner. More than 19 months have elapsed since the last lost time accident, August 7, 1947, covering 650,000 man hours worked.

Presentation of the award was made by Colonel F. C. Lynch, of the National Safety Council. Plaque and banner were accepted by the local manager, Oscar Hallburn, who stated that this accomplishment was the result of cooperation and effort between management and workers of Local No. 253 of the Pulp, Sulphite, and Paper Mill Workers whose president is Herbert Schmidt.

Danger in Salvaging Discarded Equipment

The practice of salvaging discarded pressure vessels can prove extremely hazardous. California Division of Industrial Safety points out one instance where two men were recently killed while reducing old equipment to scrap iron. They smashed a closed ammonia tank with a heavy weight before placing it between the jaws of their power shears. Evidently the smashing action compressed residual gas inside the tank, which ruptured the walls of the tank when the power shears started to cut through. Resultant explosion scattered ammonia and pieces of metal throughout the yard. Both men died as result of inhaling concentrated ammonia fumes.

All such tanks should be vented before scrapping. Regular practice is for the manufacturer of compressed gases to mutilate or cut up disused tanks in such manner that this type of accident may not occur. If the vessel has contained inflammable gases, it should be completely purged before scrapping.

Second Greater Arizona Clinic

Second in the current series of Greater Arizona economic clinics will be held in Globe on June 27 and 28, under the chairmanship of Gila County director William A. Sullivan.

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9054 Washington Boulevard Culver City, Calif.

Pacific Northwest Power

The power situation in the Pacific Northwest is extremely critical and will continue so for at least another two years. If there is a water shortage, we will be short of power until 1954, when the McNary Dam is completed.

Electric needs of the Western states will double in the next 15 or 20 years, but this expansion will be cared for by the private utility firms and the federal multi-purpose dams being built and authorized by Congress. More electric power plants all the time are being redesigned for burning coal as a fuel.

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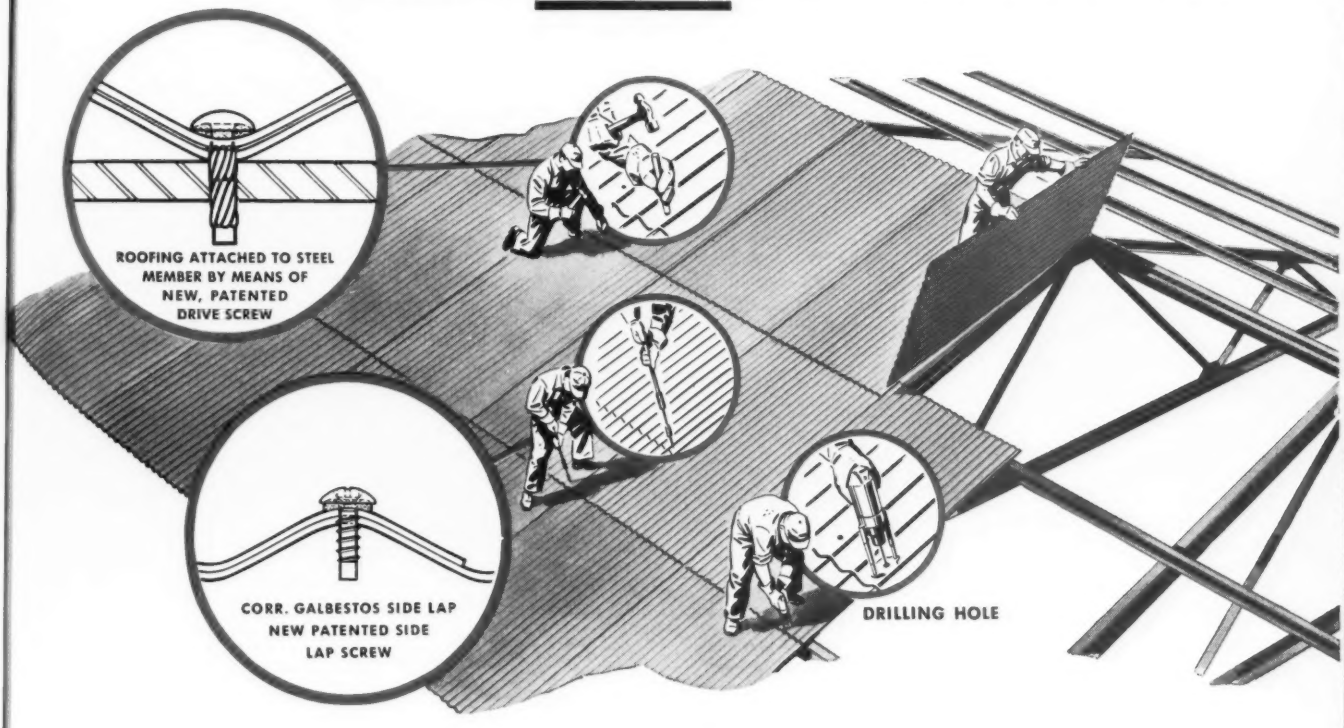
Arizona Welding Supply Co. Phoenix
J. E. Haseltine Co. Portland - Seattle
MacDonald Co. Reno
Mahl Steel & Supply Co. Los Angeles

SAME NUMBER OF MEN
SAME AMOUNT OF TIME
BUT..TWICE AS MUCH DONE


ROOFING ATTACHED TO STEEL MEMBER BY MEANS OF NEW, PATENTED DRIVE SCREW
CORR. GALBESTOS SIDE LAP NEW PATENTED SIDE LAP SCREW
DRILLING HOLE

Your own men can use Top-Speed Fastening*, a new method of attaching roofing and siding to steel frame. It's the first genuine means of cutting cost that has come out of the postwar.

Top-Speed Fastening uses a group of newly invented tools. But they're simple. And cheap. The system eliminates all interior scaffolding. So much time is saved that the same number of men in the same time can apply twice as much material.

That's big saving—and it's equally good on new construction or on repairs.

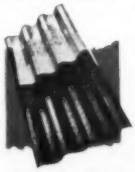
Now, here's another slant: Top-Speed Insulation* is a new method of applying insulation entirely from outside, before the sheeting is laid in place, again eliminating all interior scaffolding.

IF YOU USE TOP-SPEED FASTENING, THE TIME SAVED IS SO GREAT IT PAYS FOR THE LABOR NEEDED TO INSULATE. Therefore, you can, if you want, insulate merely for the cost of the material. Building Cost = Time + Materials. The only way to cut cost is to cut time or materials.

This ad cost a lot of money. We would waste it if we couldn't back it up! Write for the facts about TOP-SPEED FASTENING.

*patent applied for

DO YOU KNOW GALBESTOS?



Robertson's protected sheet metal is steel with asbestos fused to it by metallic alloy. The fibers of asbestos are literally embedded in metal. So inseparable is this bond that Galbestos can be worked in ordinary sheet-metal shop equipment: crimped, rolled, sheared, bent and riveted like unprotected metal.

The asbestos is impregnated with asphalt, then waterproofed. Galbestos has been proved on installations all over the world to outlast any comparable material under the most grueling weather and industrial heat and corrosion. It virtually eliminates maintenance, which is actually continuation of first cost.

Galbestos comes in standard roofing and siding sheets up to 12 ft. long; maroon or black; flat or in several corrugations; for use over steel skeleton framework. Galbestos cuts cost of new building by saving large amounts of structural steel and other materials. It needs fewer purlins, less foundation.

Galbestos has been tested and classified by the Underwriters' Laboratories, Inc. and Assoc. Factory Mutuals Ins. Co's.

Would you like to see samples? Write for details.

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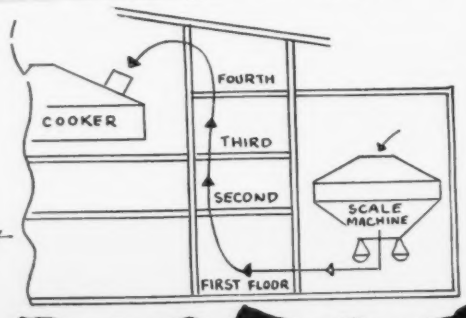
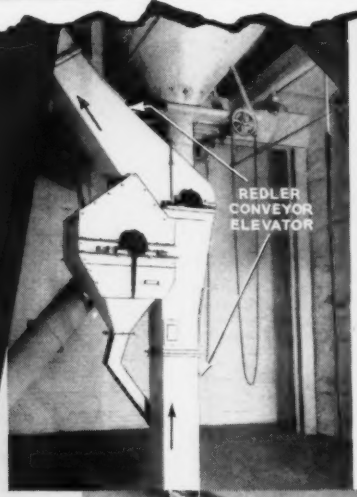
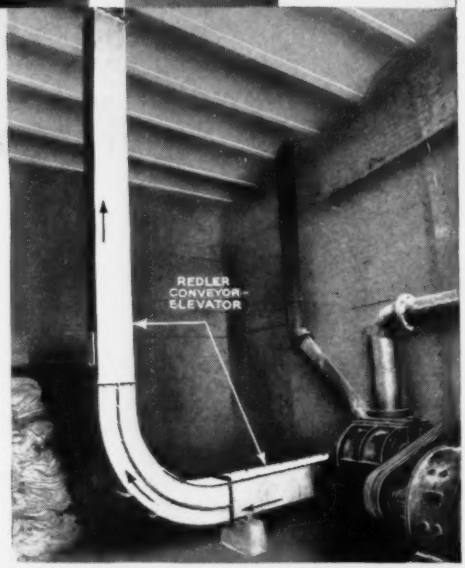
The Problem—
To keep grain clean while drawing from scale hopper and elevating four floors to processing, without dangerous dust.



THE S-A ANSWER
A "Sealed System"





★ To overcome the tri-part problem at this plant—to prevent contamination of grain, to eliminate dust and fire hazard and at the same time, convey, elevate and convey the product at low cost—S-A engineers recommended and installed this highly effective three-in-one REDLER Conveyor-Elevator.

It was a job made-to-order for REDLERS. Sealed casings prevent the entrance of foreign matter . . . compact design saves valuable space; and greatly simplified installation problems.

This is another in the long list of S-A Systems saving time and money, while assuring cleanliness, for food products manufacturers everywhere.

Upper photo: REDLER Conveyor-Elevator takes grain from scale hopper at beginning of four-floor trip. *Lower photo:* Sealed casing on entire REDLER system protects grain from contamination *all the way*.

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1007 E. Burnside St., Portland 14, Ore.

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2227 E. 37th ST., LOS ANGELES 11, CALIF

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